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TRENDS IN AMERICAN OBSTETRICS DURING THE FIRST THIRD OF THIS CENTURY

CHAIRMAN'S ADDRESS

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LOS ANGELES

Although many notable advances and changes have been made in the practice of general medicine and surgery during the present century, in no specialty have there been more drastic changes than in obstetrics.

In order to obtain a clear conception of the evolutionary changes and tendencies in obstetrics, one must first glance at the conditions that existed at the end of the nineteenth century. It must also be fully realized that much of the progress made in the present century is the direct result of the pioneer work of Cederschjöld, Holmes, Semmelweis, Pasteur, Lister, Smellie, Tarnier and many others. The assembled facts from the many traditions and observations of these pioneers have in many instances been "rediscovered" and "reapplied."

At the beginning of the century, the overwhelming majority of women in the United States and other countries were delivered by midwives, in the home. The rich could command the services of one of the few specialist obstetricians, who gave some antepartum care but usually delivered the patient at home, the labor, nevertheless, being allowed to follow its natural course. For the indigent, there were, in several large cities, lying-in hospitals, usually maintained for the purpose of providing clinical material for a teaching institution. Brodhead [1] records that the pregnant women in the Sloane Maternity Hospital in New York were systematically examined and that pelvimetry was a routine procedure. Vaginal examinations were freely made preceding and during labor. No sterile gowns or gloves were used.

Bill [2] states that in Cleveland twenty-five years ago there was no physician who limited his practice entirely to obstetrics, and there was very little obstetric hospitalization. Most of the deliveries were done by midwives, the physician being called only when the midwife encountered unusual difficulty. This should be compared with records of the same city in 1930, when 55.7 per cent of the babies were born in hospitals and approximately 45 per cent of the deliveries were made by specialists or under their supervision. During the past ten years the number of deliveries done by midwives has been reduced to less than 6 per cent.

Thus, at the beginning of this century every general practitioner had perforce to be an obstetrician; but at this time the new fledged doctor obtained his diploma to practice with little or no actual experience in clinical obstetrics. There were at this time not more than a half dozen medical schools that maintained lying-in hospitals in which medical students could witness deliveries, and the student who had actually delivered one or two women before he was graduated was considered very lucky.

Even with this, thirty-five years ago it was considered that there was but little room for improvement in the art of obstetrics. Versions, forceps operations and maneuvers for the correction of malpositions were well known to and practiced by experienced physicians, but in those days it was more generally recognized than at present that even difficult labors very often ended in spontaneous delivery if the woman was allowed a sufficiently long labor.

THE DAWN OF NEW OBSTETRICS

However, several things were happening that were destined to alter the course of obstetrics. The development of asepsis and the perfection of surgical technic in Germany had, even before 1900, made cesarean section a much more frequent operation than formerly. Norris [3] in 1899 pointed out that the successful obstetrician of that day must be a thorough surgeon and a competent gynecologist, because cesarean section and other obstetric operations were being performed with almost startling frequency. The conception of Krönig in 1894 and of Williams in 1898 that the vagina of every pregnant woman who had not been examined vaginally was sterile was new, as also was the general recognition that so-called puerperal fever was puerperal infection by the streptococcus. There occurred at the beginning of the century another innovation, the introduction of the use of rubber gloves for vaginal examinations and during delivery. A spirit was being aroused to do something actively to relieve the pain and the dangers of childbirth and to safeguard the child, as compared with the old laissez-faire policy of letting nature take its course. This was the fundamental spirit of the new tendency in obstetrics about the beginning of the twentieth century.

CAUSES THAT CONTRIBUTED TO THE CHANGED TENDENCIES IN OBSTETRICS

The principal causes that acted as contributing factors to bring about a change in the practice of obstetrics were: first, the scientific advances in medicine and surgery; second, and very important, the demands of the American woman; third, propaganda by surgeons and by those interested in making obstetrics a specialty, and, fourth, social, economic and biologic factors.

Read before the Section on Obstetrics, Gynecology and Abdominal Surgery at the Eighty-Seventh Annual Session of the American Medical Association, Kansas City, Mo., May 14, 1936.

1. Brodhead, G. L.: Modern Obstetric Technic Compared with the Technic of Twenty Years Ago, Am. J. Obst. **78**: 305, 1918.

2. Bill, A. H.: The New Obstetrics, Am. J. Obst. & Gynec. **23**: 155 (Feb.) 1932.

3. Norris, R. C.: Obstetrics, Prog. Med. **3**: 323-422, 1899.

In regard to the first, the great impetus to surgery through the development of asepsis vastly extended its field and was bound to have its reflex in cesarean section and other operative procedures connected with obstetrics. Symphysiotomy, pubiotomy and episiotomy were among such procedures which were early popularized. From the medical field came the development of several important drugs, such as solution of posterior pituitary, which was much more rapid in its action and more reliable in producing good uterine contractions than was the ergot of the day. It was not until hundreds of ruptured uteri had been reported, however, that the danger of pituitary preparations was recognized, and their real value, the control of hemorrhage after delivery, generally accepted. From the medical group also came the rapid development of methods of analgesia and anesthesia, the former to control pain during labor, the latter to render operative procedures painless. Steinbuchel introduced the method of so-called twilight sleep into German obstetric practice in 1902. Although in its original form it was dangerous and did not survive for long, it had a very definite influence on the development of the more acceptable present-day methods.

The second factor, the demands of the American woman, is one that has not been sufficiently stressed by those who criticize modern obstetrics and its results. The American woman was educated by lay propaganda to know that scientific medicine could spare her the pangs of labor without sacrificing her child. Even if physically as well as or better able to bear pregnancy and labor than generations before her, she demanded and has continued to demand and to insist that childbirth be accomplished without pain. She does not want the old method of letting nature take its course. Moreover, if she is told that the newer methods are accompanied by an increased morbidity and mortality both for herself and for her child, she ignores such possibilities and accepts all risks of anesthesia and operative procedures provided she remains in oblivion throughout the ordeal. The old generation of women looked with fear and terror to the time of labor. Today a primipara, secure in the knowledge that she will receive anesthesia and analgesia, merely looks on childbirth as an incident. If this present-day attitude is abnormal, I believe that the fault lies with the obstetric profession, which has allowed lay propaganda to be broadcast for more than twenty years and yet has not, except in one or two instances, attempted to educate the public through its own medium, the lay press.

The third factor—propaganda by surgeons and specialists in obstetrics—was a logical consequence. Women demanded a rapid, painless labor. Anesthesia and analgesia caused uterine inertia, which in turn required some type of operative intervention. To execute these procedures properly, men specially trained in operative obstetrics were necessary and answered the call. These men very naturally raised their voices in favor of their own procedures, and today it is a controversial question as to whether or not they were not, at least to some extent, right. The rational use of anesthesia and instrumentation, entirely apart from the demand for it by prospective mothers, may be the better obstetric procedure. In any case the old-fashioned practitioner who patiently sat by the bedside for long hours was ruthlessly pushed aside and his methods were scouted by the profession and the public alike.

The social, economic and biologic factors tending toward changes in American obstetrics were many. There was the great extension in urban communities of the flat or small apartment, which made hospitalization of the woman at term a necessity. Again, hospital delivery began to be looked on by women as the correct style; there is social etiquette even in obstetrics. Economically, for a large percentage of the people, free dispensaries, even free hospital service, free public health welfare clinics and many other organizations literally pushed the pregnant woman into the newer methods rather than to allow her to remain at home and call the midwife at the onset of labor. Biologic factors, such as voluntary birth control, affected obstetrics only by reducing the birth rate. But a biologic factor such as the tendency toward fewer babies and the limitation of progeny even by abortions, self induced or otherwise, must have a very definite effect on obstetrics. This, however, is an important phase which time will not permit me to enlarge on here. Another biologic obstetric factor in the United States is the mixture of races. It is well known that pelvic measurements vary in different races and that such studies as have been made of fetal head measurements show that they too manifest similar variations. Furthermore, statistics prove that in races having smaller pelves the head measurements too are proportionately smaller. This accounts for the frequency of dystocia due to disproportion in mixed marriages with women having smaller pelves and may be important in explaining the increased incidence of dystocia in America.

De Lee [4] puts the whole matter of the new tendencies in obstetrics very succinctly:

> The woman nowadays demands a safe labor, freedom from unnecessary pain, a reasonable length of labor, and when she arises from confinement a complete *restitutio ad integrum*. She also demands a healthy baby, undamaged by conditions affecting it during pregnancy and free from the effects of traumatism during labor. Modern obstetrics can give the woman nearly all of these things and people are willing to pay for them.

TRENDS OF THE NEW OBSTETRICS

The outstanding trends in American obstetrics since the beginning of the century would doubtless be seen in a different light by each obstetrician who paused to consider them. To me they may be placed under five headings: first, the changing ideals in obstetric education; second, to regard pregnancy and labor as pathologic rather than physiologic processes; third, to make parturition easier for the mother; fourth, to make obstetrics easy for the obstetrician, and, fifth, to eliminate the midwife.

OBSTETRIC EDUCATION

It is impossible to think of the development of the scientific background of obstetrics during the first quarter of the twentieth century without thinking of the late John Whitridge Williams. Professor Williams realized that real knowledge of the physiology and pathology underlying all the phases of reproduction was absolutely essential before obstetrics could ever hope for a place among the recognized specialties. Slemons [5] says: "Research, teaching, and the care of the sick were effectively blended in [his] department

4. De Lee, J. B.: Progress Toward Ideal Obstetrics, Am. J. Obst. **73**: 407 (March) 1916.
5. Slemons, J. M.: The Academic Career of John Whitridge Williams, West. J. Surg. **44**: 47 (Jan.), 100 (Feb.) 1936.

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through the chief's inherent talent for organization, and it is not easy to say in which of these fields he was most gifted."

During the same period, Cragin, Barton Cooke Hirst, Edgar and several other outstanding teachers of obstetrics developed the first specially constructed maternity hospitals and clinics in the United States and instituted the form of clinical teaching that is generally used today. There was a definite trend toward adequate obstetric education.

Never in the history of American obstetrics had there ever been a real attempt made to pause and to take stock of the real status of obstetric education until the third White House Conference, called by ex-President Hoover to meet in 1930. While previous White House conferences had been held, they were concerned chiefly with the problems of the dependent child, the social and economic status of the child, supplemented by its health and that of its mother. Under the able leadership of Fred L. Adair, who was assisted by the outstanding leaders in obstetric education and many other subjects which are directly or indirectly related to maternal welfare, the 1930 White House Conference assembled tangible facts which showed the unenviable state of obstetric education, the high maternal mortality in this country, and many other facts which were destined to lower smug satisfaction with the existing conditions. The conclusions of the committee were not destructive, however, for they pointed out causes in many instances and suggested very definite remedies. In obstetric education the necessity of combining the departments of obstetrics and gynecology was stressed, and this is being accomplished in the medical schools. The necessity of providing adequate clinical material in obstetrics for undergraduates and for careful supervision of clinical teaching was shown. The value of additional facilities for furnishing postgraduate obstetric education was emphasized, particularly in its relation to infant and maternal mortality. The development of the motion picture as a means of teaching clinical obstetrics was pointed out as a thoroughly satisfactory method of providing teaching material in those schools which lacked adequate clinical material. The use of films, properly edited and directed, presents such great possibilities that I am inclined to regard their development as a teaching method as a reasonably well established trend.

The report of the subcommittee on Factors and Causes of Fetal, Newly Born, and Maternal Morbidity and Mortality has led to a definite trend which may have the greatest influence in the reduction of morbidity and mortality. I refer to the various investigations of the local problems relating to obstetrics, a consideration of their causes and their treatment, undertaken by many medical societies, health departments and allied agencies. The problem of maternal mortality in the United States had occupied a major position in the program of the Children's Bureau since its organization, and numerous studies had previously been made by interested agencies. No general interest had been shown, however, until the report of the Committee on Maternal Mortality of the New York Academy of Medicine was released to the daily newspapers in abstract form under the title "Why Women Die in Childbirth," Nov. 20, 1933. This report brought forth a storm of protest from the medical profession, but the disinterested observer would be inclined to believe that the protests arose from the manner of its publication rather than from its major conclusions. A very definite trend was created; i. e., the investigation of each obstetric death and the responsibility for its occurrence by local and sectional societies, health departments and others in many large sections of the United States. On the West Coast, the Pacific Coast Society of Obstetrics and Gynecology is investigating every such death occurring in Washington, Oregon and California. The paper of Dr. William Benbow Thompson[6] on "Cesarean Section in Los Angeles County" is a good example of the scope of such a report. It is inconceivable to me that such investigations can fail during the next two decades to exert a favorable influence on both morbidity and mortality.

The report of the subcommittee on Basic Sciences and Their Relation to Maternal and Fetal Problems stated: "The entire fund of present information concerning what is desirable in safeguarding the health of mother and child rests, with a few exceptions, upon definite underlying principles rather than upon empiric procedure." There is definite evidence of a trend in medical schools and among research workers toward research in the problems peculiar to obstetrics. The greatest progress, however, seems to have been made in the study of the endocrines and in the development of certain drugs such as anesthetics, analgesics, oxytocics and antiseptics, because, in these fields, money has often been made available by commercial companies in the understandable expectation of profiting by the research.

IS PREGNANCY A DISEASE OF NINE MONTHS' DURATION?

There are apparently two well developed schools of thought in regard to the question Is pregnancy a disease of nine months' duration? Williams in 1926 stated: "I am inclined to suppose that many practitioners in urban communities have been led astray by the teachings of those who regard labor as a pathologic rather than a physiologic process, with the result that interference upon insufficient indications is frequently undertaken by those who do not fully appreciate the risk involved." De Lee said in 1927: "Can a function so perilous that, in spite of the best care, it kills thousands of women every year, that leaves at least a quarter of the women more or less invalided, and a majority with permanent anatomic changes of structure, that is always attended by severe pain and tearing of tissues, and that kills 3 to 5 per cent of children—can such a function be called normal?" The conservative or old school consider pregnancy and labor as natural and normal and not as a general rule to be interfered with; the new tendency regards pregnancy and labor as subjects for therapeutic measures from onset to termination; any method, surgical or otherwise, that will eliminate the discomfort, pain and/or danger of these processes is justified.

The trend during the past fifteen years has been very definitely toward increased operative intervention. Whether or not this trend will continue is debatable.

TREND TOWARD MAKING OBSTETRICS EASIER FOR PATIENT AND PHYSICIAN

These trends have been characterized by a number of procedures which may be summed up in a few words as shortening the time of labor by instrumental or operative delivery under anesthesia.

6. Thompson, W. B.: Cesarean Section in Los Angeles County, read before the section May 15 and to be published in THE JOURNAL.

Here, of course, I am not speaking of therapeutic abortion but of what is commonly accepted as labor at or near full term. The present operative furor in obstetrics began with the introduction of the obstetric forceps and the substitution of the physician for the midwife in obstetrics. It has gained impetus with every generation. In the first two decades of this century there was a tremendous increase in forceps delivery, delivery by internal podalic version, by abdominal cesarean section, by low so-called prophylactic forceps with episiotomy, by low cervical cesarean section, and more recently the routine induction of labor by artificial rupture of the membranes at estimated full term.

So far back as 1899 Norris [3] wrote: "The radical tendency (to perform cesarean section) which has recently been manifested by articles on this subject by men high in the profession I cannot but regret, and I can see in this a dangerous teaching which will be exceedingly apt to lead to unhappy results." The unhappy results are strikingly shown by Plass,[7] whose figures in 1931 showed an increasing year-by-year incidence of cesarean sections in representative American hospitals and who presented mortality figures for cesarean operations in large sections of the population, which varied from a low of 4.2 per cent to a high of 16.1 per cent.

In 1920, at the meeting of the American Gynecological Society, De Lee [8] described his "prophylactic forceps" operation, in which he recommended, particularly in primiparas, that, when distention of the perineum was evident, episiotomy be performed and the patients delivered with forceps. In spite of very pronounced opposition, his method has had a very strong following.

Available statistics would indicate that the maternal mortality from forceps operations is low.[9] Maternal morbidity, as well as fetal morbidity and mortality after forceps, has been shown rather definitely to be increased.

Internal podalic version received an extraordinary impetus in 1920, when Potter [10] of Buffalo introduced some modifications and expressed the opinion that every obstetric patient should be delivered by this method at the end of the first stage of labor if feasible, so as to avoid the discomfort of the second stage. Williams [11] tritely remarked that possibly Potter was right and the rest of the obstetric world was wrong, and Polak [12] said regarding Potter's report of 1,113 labors with 920 versions and eighty cesarean sections, with a fetal mortality of 6.7 per cent: "His operative incidence is so much greater than has been shown to be necessary, and his fetal mortality so much higher, that I cannot see on what ground he claims endorsement for his procedure." These innovations, however, in spite of the condemnation which they have received, already have had some distinctly beneficial effects. Today forceps are used more frequently than formerly, and yet far more safely. The high forceps operation has been abandoned in favor of version or of low cervical cesarean section. The use of low forceps has become very common, and its advocates have been able to show real benefit when proper conditions are present and good technic is used. Potter's technic has resulted in vastly improved results in the treatment of breech presentations in my clinic, and his advocacy of podalic version has been an important factor in the elimination of the high forceps operation, it having been definitely proved that podalic version is a far safer procedure than high forceps.

The obstetric operative incidence in hospital practice in the United States is said to vary from 10 to 30 per cent of all deliveries as compared with 4 per cent in European and other countries in which midwife delivery is the common practice. Epstein and Fleischer [13] found that the morbidity risk in operative obstetrics, as compared with nonoperative, was in the ratio of 5:1 and that the maternal mortality risk was 30:1. For the year 1929 Holmes [14] found that 445 hospitals with 221,859 deliveries reported 46,946 operative terminations of pregnancy or labor.

It has been noted that the present trend toward operative intervention in obstetrics began with the introduction of the obstetric forceps and the elimination of the midwife and has gained impetus with each succeeding generation.

I shall quote the opinion written by Francis H. Ramsbotham of the Royal College of Physicians, London, England, in 1841 and compare it with the opinion of E. D. Plass, written in 1931, regarding this operative furor.

Ramsbotham said:

> Although in skilful, and especially discriminating hands, obstetric instruments must be regarded as great blessings to the suffering sex, yet it is a question with some practical men, whether by their unnecessary use they have not produced on the whole more injury than good. During the long reign of barbarous surgery, there is ample evidence to prove that operative interference was often most unjustifiedly had recourse to, and there is good reason to fear that many women have dragged out a wretched existence to the end of their days, the miserable victims of impatience, ignorance, or violence. In no few instances, the child's, if not the mother's life has been sacrificed, when patience, perseverance, and a proper reliance on the natural powers, were the only obstetric auxiliaries required.
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> I would not have it thought, by these observations, that I am unable to appreciate the advantages sometimes resulting from instrumental aid, or that I would draw an argument against a valuable measure from the possibility of its abuse. I know too well that nature sometimes fails, and occasionally both the mother and her offspring would be overwhelmed in one common fate unless art stepped in. But I would endeavor to impress deeply upon the mind of the young practitioner, that urgent necessity alone will warrant him in taking an obstetric instrument in hand, and that, when a choice is allowed him, he should leave nature to accomplish her own purpose, provided, indeed, that he can with safety trust her.
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> In his practice he will find it much more difficult to determine the time when instrumental aid may have become necessary, than to administer that aid, and unfortunately he will find the most deadly means most easy of application. Many times, also, he may almost be persuaded, against his own opinion, to the adoption of these means, by the urgent and unceasing solicitations of the patient. I would entreat him neither to allow these considerations to weigh with his judg-

7. Plass, E. D.: The Relation of Forceps and Cesarean Section to Maternal and Infant Morbidity and Mortality, Am. J. Obst. & Gynec. **22**: 176 (Aug.) 1931.
8. De Lee, J. B.: The Prophylactic Forceps Operation, Tr. Am. Gynec. Soc. **45**: 66, 1920.
9. Plass,[7] Maternal Mortality in Fifteen States, Children's Bureau publication 223, 1934, p. 64.
10. Potter, I. W.: Version, Am. J. Obst. & Gynec. **1**: 560 (March) 1921.
11. Williams, J. W.: A Criticism of Certain Tendencies in American Obstetrics, New York State J. Med. **22**: 493 (Nov.) 1922.
12. Polak, J. O.: Forced Labor; Its Status in Obstetrical Teaching, Am. J. Obst. **2**: 237 (Sept.) 1921.
13. Epstein, H. J., and Fleischer, A. J.: "Sane" Obstetrics, J. A. M. A. **97**: 219 (July 25) 1931.
14. Holmes, R. W.: Institutional Obstetrics in the United States in 1929, Tr. Am. Gynec. Soc. **59**: 321, 1934.

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ment, nor to let that less worthy motive, a wish to take advantage of the éclat likely to result from a successful operation, tempt him to act contrary to his own feelings of propriety.

Nearly 100 years later, Plass [7] said:

> The marked increase in forceps deliveries in this country is accounted for largely by the performance of "convenience" operations. Although they have been dignified by the name of "prophylactic forceps," there is no good evidence that they prevent anything but loss of time on the part of the operator. The increased use of cesarean section is merely part of the modern operative furor, but from the standpoint of maternal mortality probably the most important, since by conservative estimate the death rate is between 5 and 10 per cent.

Thus two men, both well qualified to speak on the subject but living in widely separated countries and writing a hundred years apart, give the same advice. But in spite of the unanimity of opinion on the part of those who are best qualified to express the facts, and in spite of the commonly accepted obstetric axiom that any intervention with normal labor carries a definite risk, neither the operative incidence nor obstetric mortality is being lowered.

In spite of this gloomy picture of radical obstetrics during the first third of the century, several trends in favor of conservative obstetrics are apparent. The very great extension of the antepartum care of the pregnant woman has been outstanding. This has been in great part due to the efforts of the Children's Bureau. Such antepartum care not only has resulted in stricter supervision of the hygiene of pregnancy but also has stimulated the early recognition of toxemias of pregnancy, deformed pelves, and many medical complications of pregnancy which were formerly unrecognized. In eclampsia, particularly, a very definite trend away from radical measures, such as routine cesarean section in favor of conservative measures, is very apparent. The discovery of insulin has completely changed the prognosis for the diabetic patient who becomes pregnant, the management of cardiac patients during pregnancy has undergone great changes, and the introduction of blood transfusions in the treatment of the obstetric hemorrhages has been of incalculable benefit.

Efforts to treat obstetric complications as such, rather than to terminate the pregnancy, are continually increasing.

THE ELIMINATION OF THE MIDWIFE

The fourth trend in American obstetrics during this century has been to eliminate the midwife as a factor in obstetrics. De Lee,[15] whose great influence on American obstetrics is acknowledged by all, has been consistently opposed to her.

In 1902 Hirst [16] recommended "that the average obstetrical case be entrusted to a highly trained, well informed, skilful, and experienced nurse, the physician being called to repair the injuries of childbirth, to deal with any complications or abnormalities that might arise, to make perhaps routine visits, and above all to make the final examination at the end of puerperal convalescence." Hirst probably was thinking of the maternal mortality in Holland and the Scandinavian countries, where the maternal death rate is the lowest in the world. In these countries 85 per cent of the deliveries are done by midwives who do not use forceps or other instruments and who are instructed and supervised by physicians. He was also thinking of home deliveries and did not, of course, visualize the vast increase in the number of hospital deliveries.

Figures can be given [17] that show the relatively high and the relatively low maternal mortality in cases attended by midwives, but such figures are not at all conclusive. The Medical Advisory Committee of the Children's Bureau in commenting on maternal mortality in fifteen states says: "Figures given in the report would indicate that, although the midwives played a part in the mortality, they could not have been responsible for any large proportion of the deaths because they attended a relatively small proportion of the cases."

Regardless of arguments for or against the midwives, they are being eliminated in by far the greater portion of this country. It seems probable to me that the real reason for this lies in the general recognition of their lack of training, as well as to the already mentioned demand of the American woman for a short and painless labor.

APPARENT TRENDS CHARACTERIZING OBSTETRICS IN PRESENT CENTURY

Can any lesson be drawn from a consideration of the apparent trends which have characterized obstetrics in the United States during the present century? Bill [2] says:

> It would seem that the most marked feature of present-day obstetrics is the fact that there is a distinct spirit of activity, of being ever alert to do something to relieve the patient and to safeguard her and her baby from the dangers which are ever associated with labor, as against the older policy so often expressed of letting nature take its course. . . .
>
> The new school of obstetrics . . . is without doubt here to stay. There seems to be a feeling of skepticism on the part of many obstetricians, who, while admitting the advantages to the patient of such methods when properly carried out, doubt the wisdom of approving them because such procedures are not within the capabilities of the profession as a whole.

Of the rather definite trends that I have discussed, the trend toward increased operative intervention, with its resultant effect on maternal and infant mortality, alone seems to demand concerted effort in an attempt to change or modify its undesirable features. I can find no record in the literature in which any trend which has existed for more than a hundred years and which shows a constantly increasing acceleration has been checked by the warnings of medical leaders or by similar propaganda. It seems inconceivable to me that any good can come of the present propaganda that is appearing in one of the women's magazines and in certain newspapers, and it appears possible that such articles can actually produce harm. If this is true there can be but one possible solution; i. e., radical changes in obstetric education. The chief adverse criticism of the new obstetrics is on the ground that the profession in general cannot carry out such methods. This is obviously true; for physicians untrained in obstetrics have no place in the new school, just as the physician untrained in surgery should not attempt to do major surgery.

Undergraduate obstetric education is receiving increased attention from the administrative officers of all schools that maintain medical departments, as well as from all of the three leading national societies.

15. De Lee, J. B.: Several Everyday Obstetrical Problems, Am. J. Obst. **76**: 15 (July) 1917.
16. Hirst, B. C.: The Future of Obstetrics as a Specialty in America, Am. Med. **3**: 815, 1902.
17. McCord, James, cited by Skemp, A. A.: General Practitioner's Response to Challenge of Obstetrics, Wisconsin M. J. **31**: 527 (Aug.) 1932.

The helpful efforts of the Council on Medical Education and Hospitals have been outstanding. Adair,[18] in discussing this subject before the thirty-second Annual Congress on Medical Education in February 1936 summed it up perfectly when he stated: "Obstetric teaching of undergraduates requires adequate proportionate time, ample facilities and capable instructors. It is important to carry out this program in all schools as quickly as possible, because even after they are accomplished it will still be ten or fifteen years before the results are generally realized by the public."

Postgraduate obstetric education is, and will continue to be during the next twenty or twenty-five years, the most important factor in molding the new obstetrics. In many hospitals which provide rotating services for interns, a service in obstetrics is not provided for all interns, in spite of the fact that it has been shown that 35 per cent of the average physician's practice during the two years following graduation is in obstetrics. The number of institutions providing adequate residencies in obstetrics is increasing, but the facilities are still too limited. To provide adequate training, I believe in the home delivery service, because it is impossible for the young practitioner to apply what he has learned of the management of labor under the favorable conditions in the hospital to the much less favorable conditions of the patient's own home, unless he has had definite and specific instructions in a specialized technic for the conduct of labor under such conditions and has applied these instructions in a practical way. The training must include a service of not less than six months in obstetric and gynecologic pathology, because without such experience the young obstetrician can never expect to understand the basic processes underlying the conditions which he is attempting to treat. His hospital service can be adequate only if the staff is properly trained and is genuinely interested in teaching.

The recently formed American Board of Obstetrics and Gynecology, whose function it is to supervise, but not to control, obstetric practice, to encourage the study of obstetrics and to grant certificates of special knowledge in obstetrics to those who are properly qualified, has already had a pronounced influence in checking radical tendencies, in stabilizing the practice of obstetrics and in setting definite standards which should be met before the practitioner would be justified in claiming that he or she was a "specialist."

The most important phase of postgraduate obstetric education now, and for the next twenty-five years, is the education of the great bulk of practitioners whose undergraduate education may or may not have been inadequate, whose hospital training was often sketchy and who, because of the exigencies of their practice or because of their locations away from medical centers or for other reasons, have not been able to keep up with the changes that have occurred during their professional lifetime. There is a very definite duty on the part of all governmental agencies, medical schools, societies and allied agencies interested in maternal welfare to provide systematic instruction for, until recently, the forgotten man, who is, in fact, delivering most of the babies in the United States.

The Children's Bureau, under the Social Security Act, title V, part 1, acting with the state health agency, and always in cooperation with state and local medical groups and organizations, has approved and is fostering extension courses in obstetrics for groups of local practitioners. It is hoped that this phase of each state plan will be as enthusiastically received by the local profession as have similar plans under the auspices of state universities and/or state health departments, in cooperation with the state and local medical societies in California, Florida, Georgia, Iowa, Kansas, Kentucky, Maryland, New York, Oklahoma and Wisconsin.

18. Adair, F. L.: Undergraduate Obstetric Education, J. A. M. A. **106**: 1441-1442 (April 25) 1936.

CONCLUSION

It is a well known fact that the better trained in obstetrics a physician is, the fewer major operative procedures he finds it necessary to perform. While rather drastic changes in the practice of obstetrics have occurred during the present century, I cannot help feeling that obstetrics today is in a transitional stage and that, as obstetric practice gradually comes into the hands of those who have received adequate training, many of the present-day trends may be modified and then utilized to make pregnancy safer and easier for the American woman.

523 West Sixth Street.

PERICARDITIS EPISTENOCARDICA

FRANK BILLINGS LECTURE

GEORGE BLUMER, M.D.

NEW HAVEN, CONN.

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To one who for many years enjoyed the privilege of friendship with Frank Billings, and who admired both his character as a man and his acumen as a clinician, it is a source of gratification to be invited to deliver this annual lecture which perpetuates his name. It is natural, I think, in such circumstances, to cast around for some subject in which Frank Billings himself was interested, and among the many topics on which he wrote was pericarditis.[1] For this reason I have chosen to speak today on a particular type of this disease; namely, the so-called pericarditis epistenocardica.

DEFINITION OF THE TERM

I would remind you, first of all, that it is only in recent years that we have been able to differentiate the angina pectoris of effort from coronary occlusion, and I would point out that, in the past, both conditions were described in the literature of English-speaking physicians as angina pectoris. The term angina pectoris, introduced by William Heberden Sr. in the eighteenth century, has never been generally approved by physicians on the continent of Europe, who have preferred the term stenocardia, first introduced by Brera[2] in 1813. Their objection to the designation "angina pectoris" lies in the fact that it merely describes a symptom and gives no idea of the pathologic changes underlying the syndrome. On the other hand "stenocardia," derived from two Greek words meaning "narrowing" and "heart," is really no better unless one assumes that by narrowing of the heart continental physicians really mean narrowing of the coronary vessels. In any event it is clear

The seventh Frank Billings Lecture, read before the Section on Practice of Medicine at the Eighty-Seventh Annual Session of the American Medical Association, Kansas City, Mo., May 13, 1936.

1. Billings, Frank: Clinical Observations in Pericarditis, J. A. M. A. **37**: 1503 (Dec. 7) 1901.
2. Brera, V. L.: Jahrb. d. deutsch. Med. u. Chir. **2**: 36, 1813.

that pericarditis epistenocardica signifies the type of pericarditis which accompanies the syndrome of stenocardia or angina pectoris.

FROM THE HISTORICAL POINT OF VIEW

The historical aspects of pericarditis epistenocardica are not without interest. A survey of the postmortem records of patients who died with a clinical diagnosis of angina pectoris, particularly those who suffered from the so-called status anginosus, clearly shows that pathologists appreciated the significance of coronary occlusion long before clinicians were fully alive to its import. Weigert in 1880 called attention to the relationship between coronary sclerosis, coronary thrombosis and cardiac infarction, and Cohnheim and von Schulthess-Rechberg confirmed his views by their experimental work on dogs. Huber also in 1882 supported Weigert's position and showed that he had a clear insight into the pathology of coronary thrombosis, including its relation to cardiac aneurysm. Furthermore, compilations of autopsies on patients dead of angina pectoris, such as that of Huchard,[3] show many with either fresh or organized pericarditis and there are many reports in the literature of small groups or isolated patients with similar pathologic changes.[4]

On the clinical side, the noteworthy historical fact is that pericarditis epistenocardica was undoubtedly described long before its significance was grasped. As early as 1872 Christian Bäumler, then one of the physicians to the German Hospital in Dalston, published in the *Transactions of the Clinical Society of London* a paper entitled "Cases of Partial and General Idiopathic Pericarditis." Three of the patients therein described presented the classic picture of coronary closure with recovery. One of these was Bäumler himself, who had his attack at the early age of 25, the presence of localized pericarditis being observed by his colleagues Denninger and Kussmaul. Bäumler finally died three years ago at the age of 97. Those of his conclusions which are germane to the subject are as follows:

> Pericarditis may occur on a very limited part of the pericardial surface. Such partial pericarditis generally passes off in a few days, well marked symptoms being only present for a short time. The chief symptoms of such cases are: pain in the precordial region, difficulty in breathing through the pericardial pain, and irradiated pains in the throat, neck, left shoulder and left arm. The heart's action is accelerated, and becomes much more easily affected than in health by even slight muscular action; the temperature of the body is only slightly raised; there is well marked pericardial friction sound, giving evidence of roughness of the membrane, and probably of some fibrinous exudation, but there are no signs of a fluid effusion, of which probably, if any, a very small amount only is present.

When one considers that this description was written before the days of blood pressure estimations and leukocyte counts, it must surely be regarded as an extraordinarily accurate account of coronary occlusion with pericarditis.

Byrom Bramwell [4] and Pawinski [5] also reported cases of pericarditis epistenocardica, though they entirely missed their significance. Bramwell surmised that the attack of angina pectoris from which his patient suffered was due to the pericarditis, and the title of Pawinski's paper, "Concerning the Influence of Dry Pericarditis on the Origin of Stenocardia and Cardiac Asthma," indicates that he held a similar view.

The first writer on pericarditis epistenocardica who fully realized its relationship to coronary occlusion appears to have been Kernig.[6] In a brief report on the treatment of angina pectoris, which was presented before the Association of Saint Petersburg Physicians in 1892, he stated that "the severe, hours long attacks of angina pectoris are probably caused by thrombotic or embolic processes in the coronary arteries." He calls attention to the pericarditis, which occurs in some cases during the days following the onset of the attack, and explains this as being due to the area of cardiac infarction reaching the pericardial surface. In a later article, published in 1905, he [7] pointed out how little there was at that time in medical literature about the cardiac changes after an attack of angina pectoris. He contrasted the brief duration of attacks of angina of effort with the so-called status anginosus, called attention to the presence of fever in the latter group of cases, and thought that they also showed enlargement of the heart.

In 1910 Maximilian Sternberg [8] reported two cases of pericarditis accompanying coronary occlusion and suggested the name "pericarditis epistenocardica." He pointed out that the anginal attack was unusually severe and prolonged, that fever generally appeared on the second day and that a pericardial friction was generally demonstrable on the second, third or fourth day. He stated that the pericardial rub occurred in a circumscribed area and was to be heard only over a period measured by hours. He stated that the fever was not very high and lasted, as a rule, only a few days. He noted that in acute cases there was recent obstruction of a coronary branch with the formation of a necrotic infarct with overlying pericarditis, while in old cases there was evidence of old obstruction in a coronary branch with scar tissue at the site of the former infarct and, not infrequently, cardiac aneurysm. He stressed the noninfectious nature of the pericarditis.

Following Sternberg's paper, numerous references to pericarditis epistenocardica appeared in general reports on the symptomatology of coronary occlusion,[9] and special papers on this particular sign have been published by Gorham,[10] Adlersberg,[11] Loewenberg,[12] Halbron and Lichtwitz [13] and several others.

It is clear, then, that pericarditis epistenocardica was described as early as 1872 but that its significance has been fully understood only since 1910.

PATHOLOGIC CONSIDERATIONS

A brief consideration of the pathologic changes of pericarditis epistenocardica is necessary in order to understand not only why it is present in some patients but also why it is absent in others. The discussion of the history of the condition has already made it clear that cardiac infarction, resulting from sudden blocking of a branch of one of the coronary arteries, produces localized pericarditis when the necrotic process in the heart wall involves the visceral pericardium. Either the

3. Huchard, H.: Traité clinique des maladies du cœur et de l'aorte, ed. 3, Paris, Octave Doin **2**: 522, 1899.
4. Cauchois: Gaz. d. hôp. **43**: 138, 1870. Sibson, F., Reynolds' System of Medicine, 1877. Bramwell, Byrom: Diseases of the Heart, Edinburgh, Pentland, 1884, p. 310.
5. Pawinski, J.: Deutsches Arch. f. klin. Med. **58**: 565, 1897.
6. Kernig, Vladimir: St. Petersburg. med. Wchnschr. **17**: 177, 1892.
7. Kernig, Vladimir: Berl. klin. Wchnschr. **42**: 10, 1905.
8. Sternberg, Maximilian: Wien. med. Wchnschr. **60**: 14, 1910.
9. Osler, William. Lancet **1**: 697, 1910. Herrick, J. B.: Clinical Features of Sudden Obstruction of the Coronary Arteries, J. A. M. A. **59**: 2015 (Dec. 7) 1912.
10. Gorham, L. W.: Albany M. Ann. **41**: 109 (April) 1920.
11. Adlersberg, D.: Wien. med. Wchnschr. **72**: 270, 1922.
12. Loewenberg, R. D.: Deutsches Arch. f. klin. Med. **142**: 189 (April) 1923.
13. Halbron, P., and Lichtwitz, A.: Bull. et mém. Soc. méd. d. hôp. de Paris **52**: 195 (Feb. 16) 1928.

coronary trunk or its branches may be involved, but most cardiac infarcts are found in the lower third of the anterior surface of the left ventricle in the neighborhood of the apex, because the descending branch of the left coronary artery is most often the site of advanced arteriosclerosis.

A study of autopsies collected by various authors furnishes information as to the frequency and character of the pericardial changes in coronary occlusion. In Huchard's series of 185 postmortem examinations [3] there are thirty-one in which there is clear evidence of recent coronary occlusion and in seven of these, or 3.7 per cent, acute, usually localized, pericarditis was present. Parkinson and Bedford [14] report eighty-three autopsies on patients dead of coronary occlusion with pericarditis in eleven, or 13 per cent. Wearn [15] found pericarditis in four out of nineteen autopsies; i. e., in 20 per cent. Wolff and White [16] found pericarditis in 48 per cent of their autopsies. A combination of the four series gives 21 per cent with evidence of pericarditis.

These figures show a marked variation in the incidence of pericarditis with cardiac infarct, a result which is, no doubt, partly due to inadequate observation in some of the earlier series, but mainly due to the fact that the number of hearts which were studied is not nearly large enough to furnish a satisfactory basis for statistical evaluation. The important fact that the figures bring out is that the clinician cannot expect to find evidences of pericarditis in every patient with coronary occlusion.

The main reason for the absence of pericarditis in many hearts that are the site of coronary occlusion is doubtless, as Parkinson and Bedford state, the fact that "infarction usually involves the endocardial aspect of the heart and is often separated from the pericardium by a layer of muscle which obtains a blood supply from the epicardial vascular network." As the same writers observe, another factor which may prevent spread of the lesion to the pericardial surface is adiposis of the visceral layer.

While these anatomic facts explain the infrequency with which the clinician detects pericardial friction in his patients with coronary occlusion, they do not tell the whole story. Sometimes a friction rub is absent because a patient has had a previous attack which has led to obliteration of the pericardial sac. More frequently the failure to detect pericarditis is due to the brief duration of the friction rub, which may be present for only a few hours. Nor should it be forgotten that even widespread pericarditis is frequently overlooked by the clinician. Some patients, of course, do not live long enough for signs of pericarditis to develop.

The type of exudate is usually described as fibrinous, and it is only in occasional patients that effusion, sufficient in amount to be detected clinically, is present. Several observers note that the exudate is free from bacteria.

CLINICAL FEATURES

It is difficult to judge of the frequency with which pericarditis may be recognized by the clinician in patients with coronary occlusion. Parkinson and Bedford recognized it only seven times in a hundred patients, but there are many reports on small groups of patients in whom it was discovered much more frequently than this. In 109 patients whom I saw at some period during the ten days immediately following an acute coronary occlusion, thirty-two, or 22 per cent, showed pericarditis. As many of these patients were seen but once it would seem as though this was a conservative figure, but when one considers that a consultant is apt to see the more serious cases it may be too high. The clinical reports, like the pathologic reports, do not, as yet, cover a number of cases sufficiently large for statistical purposes.

The day of the disease on which pericarditis is first likely to be noticed is obviously of diagnostic importance. In none of my thirty-two positive cases was pericarditis originally detected after the tenth day. In twenty-nine of the thirty-two positive cases it occurred on the first to the fourth day. In the remaining three patients it was noted on the fifth, the eighth and the tenth day. In only three patients was pericarditis recognized within twenty-four hours of the onset of the attack, so that in 81 per cent of the positive cases it occurred on the second, third or fourth days, twelve times on the second day, eight times on the third day, and six times on the fourth day. The cases reported in the literature show approximately the same distribution.

The location of the friction rub was, as might be expected from the pathology of the condition, most frequently in the region of the lower portion of the left ventricle. In five patients the pericardial rub was heard in the apical region, usually to the median side; in twelve it was described as being over the lower end of the sternum, usually on both sides of the median line but occasionally to the right or the left of it. In only three patients was the friction rub limited to the basal region.

The extent of the friction rub was almost always limited. Usually it was heard over an area not more than 5 or 6 cm. in diameter. In a few patients the area of friction enlarged somewhat as the disease progressed, and in one patient, with only a small area involved, the sound of the friction was transmitted to both axillae and to the back. There was one patient in whom the friction was heard all over the left side of the heart and one in whom, at its period of maximum intensity, it was audible from nipple to nipple and from the episternal notch to the xiphoid cartilage.

The duration of the friction rub was usually transitory, as is generally stated by other observers. In patients seen on successive days a loud friction rub often disappeared between the first and the second examination. However, there was one patient in whom the friction persisted for four days, one in whom it lasted five days, three in whom it was present for eight days, and one who showed friction continuously for two weeks.

No patients with demonstrable pericardial effusion were observed by me, but such cases occur at times and have been described by Master and Jaffe [17] and by others.

It is not possible to state definitely whether pericarditis accompanying coronary occlusion has any bearing on the prognosis of the disease. Of my thirty-two patients with pericarditis epistenocardica, thirteen died and nineteen recovered. This would seem to indicate that the presence of pericarditis is not necessarily of evil omen, but the number of cases reported is altogether too small to permit of positive conclusions.

14. Parkinson, J., and Bedford, D. E.: Lancet **1**: 4 (Jan. 7) 1928.
15. Wearn, J. T.: Am. J. M. Sc. **165**: 250 (Feb.) 1923.
16. Wolff, L., and White, P. D.: Boston M. & S. J. **195**: 13 (July 1) 1926.
17. Master, A. M., and Jaffe, H. L.: Coronary Artery Thrombosis with Pericardial Effusion, J. A. M. A. **104**: 1212 (April 6) 1935.

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My experience does not permit me to pass judgment on the claim of Barnes [18] that a characteristic electrocardiographic pattern is found in patients with coronary occlusion and pericarditis. Barnes describes the typical electrocardiographic record in such patients as showing elevation or upward rounding of the RST segment in all leads and states that this may be followed by inversion of the T wave in all leads.

CONCLUSIONS

1. A usually localized and usually transitory pericarditis is clinically demonstrable in a certain proportion of patients with coronary occlusion, possibly in a third of them.

2. Occasionally much more widespread pericarditis is present, which may involve the entire pericardial sac and eventually lead to its obliteration.

3. In some patients the signs of pericarditis persist for as long as two weeks.

4. When present in a patient suspected of having coronary occlusion, a localized pericarditis is of great diagnostic value; its prognostic value cannot be determined until a large series of cases is available for analysis.

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WOUNDS OF THE THORACIC VISCERA

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The danger from chest wounds is in a large measure due to the narrow margin of safety under which the thoracic viscera work. A rapid change of pressure relationships within the thorax affects the aeration of the blood, the filling and emptying of the heart, and the circulation not only in the thorax but also of the whole body. A knowledge of certain fundamentals of the mechanics of respiration is therefore a necessary prerequisite for the surgery of this field.

Wounds of the thorax are common in civil practice as well as in war surgery. In the past five years (1931 to 1935 inclusive) 553 patients have been treated at the Emory University Division (colored) of the Grady Hospital (municipal) for penetrating chest wounds. That the number of such cases is increasing is shown by the fact that, in the nine years previous to 1931, 511 similar cases were treated in the same hospital.

Thoracic injuries in civil life are different from those seen in war injuries and are less severe. In the former a knife, ice pick, or pistol bullet are the usual weapons, and large sucking wounds, such as are made by shrapnel, are less frequently seen. The lodgment of clothes, ribs and shell, giving rise to serious infection, is therefore more rarely a complicating factor.

The most common weapon is the "switch blade" knife (354 cases), with a long, thin, 4 inch blade. It usually causes a small external opening, which immediately closes; occasionally when pulled out in an intercostal space it produces a large sucking wound. Next to the knife, the ice pick (ninety-three cases) is the weapon most commonly used. It rarely produces a sucking wound and the injury produced by it is not severe unless the heart is penetrated, which happened once in this series. Of decreasing frequency are the pistol (eighty-four cases) and shotgun wounds (eighteen cases), accidental injuries from nails and splinters, and crushing injuries from automobile accidents.

Pleuropulmonary lesions may be divided into those having (1) open wounds of the thoracic wall and (2) those having closed wounds. Open wounds are by far the more dangerous, the degree of danger depending on the size of the wound, the amount of foreign material carried into the chest, and the injury to the viscera. If the opening is smaller than the larynx, the lung collapses; but on inspiration partial expansion occurs and respiration is only slightly embarrassed. If the opening is larger than the larynx, air will enter more freely than through the trachea and mediastinal flutter will occur. This subjects the heart and great vessels to varying degrees of pressure, and some air passes from one lung to the other in useless exchange. The clinical picture is one of terror, air hunger, and eventual asphyxiation. The first principle in the treatment of any sucking wound is the immediate closure of the opening. In this series forty patients had sucking wounds and were so treated.

Pleuropulmonary lesions with a closed wound are more common and far less dangerous. They are usually caused by a knife or ice pick, and the external wound has closed spontaneously or has been converted into a closed lesion by suture. The main problem in the treatment of thoracic injuries in civil life is therefore concerned largely with closed wounds and the conditions arising from injury to the thoracic viscera. In this series treatment was always dependent on the symptoms exhibited by the individual patient rather than by a set rule. In the main the treatment was conservative and nonoperative, although operation was carried out for heart wounds, for large lacerated wounds of the lung, for hemorrhage from an intercostal or internal mammary vessel, or for compression pneumothorax.

The most frequent conditions encountered were hemothorax, pneumothorax, hemopneumothorax and subcutaneous emphysema. The general symptoms of dyspnea, painful respiration and hemoptysis were the most common.

HEMOTHORAX

Hemothorax occurred in 209, or 37 per cent of the patients, and varied from a small amount of blood as disclosed by roentgenogram to an amount filling one pleural cavity. Its source is from a wound in the lung, the heart, or an internal mammary or intercostal vessel. When there is evidence of a rapidly increasing hemorrhage or of a heart wound, immediate operation should be carried out, but as a rule wounds of the lung will stop bleeding as the lung is compressed. Many methods of treating hemothorax have been advocated, and until the past three years the method in this service has consisted of bed rest, morphine for relief of pain, and frequent aspiration of any bloody fluid. Having shown by animal experiments [1] that blood and clots were rapidly and completely absorbed with few pleural adhesions, we began less frequent aspiration in the human cases. The results in the past three years seem to justify the present plan of treatment; namely, aspiration only for pain and dyspnea. In those patients requiring aspiration the average amount removed was

18. Barnes, A. R.: Am. Heart J. **9**: 734 (Aug.) 1934.

From the Department of Surgery, Emory University School of Medicine.
Read before the Section on Surgery, General and Abdominal, at the Eighty-Seventh Annual Session of the American Medical Association, Kansas City, Mo., May 15, 1936.

1. Sandison, J. C., and Elkin, D. C.: Penetrating Wounds of the Chest, J. Thoracic Surg. **2**: 453 (June) 1933.

600 cc. In one case 1,400 cc. was removed on the first day, 1,400 cc. on the second day and 3,400 cc. on the fourth day. This patient recovered and was discharged from the hospital on the eleventh day. The amount of fluid removed from the chest was as great in stab wounds as in those caused by bullets.

The mortality for patients with hemothorax treated by conservative methods was 6 per cent. The deaths were as frequent in stab wounds as in those produced by bullets. Patients with hemothorax usually have an elevation of temperature for several days; if this continues for a week, aspiration for culture should be done.

PNEUMOTHORAX

Pneumothorax occurred in 133, or 24 per cent, of these cases. This condition, unless associated with some other injury, rarely required treatment other than rest and morphine. The presence of air, collapsing and splinting the lung, in itself aids healing, and as the air is absorbed the lung readily reexpands. Lung expanding exercises, as with blow bottles, can do no possible good in closed pneumothorax and may cause harm. If dyspnea is distressing, the aspiration of a portion of the air will give great relief but should be done with great care lest the wound in the expanding lung be reopened. Bilateral pneumothorax may be produced by a wound of both lungs, as occurred twice in this series, or by sudden compression of the chest without an external wound. The latter was seen on one occasion as a result of an automobile accident in which the patient was thrown suddenly against the steering wheel, probably rupturing both lungs without a penetrating wound. If dyspnea is marked, bilateral aspiration or water-seal drainage of both lungs should be done.

Compression pneumothorax, caused by a valvelike action of a wound in the lung or bronchus, requires immediate treatment. The symptoms are those of rapidly increasing air hunger and cyanosis, with displacement of the mediastinum toward the uninjured lung. With each inspiration air enters the pleural cavity but cannot escape on expiration. Thus the intrathoracic pressure is gradually increased, compressing the venae cavae and interfering with the circulation. Treatment consists of removal of the air by suction or by the introduction of a water-sealed intercostal tube of sufficient size to allow its escape.

HEMOPNEUMOTHORAX

Hemopneumothorax occurred in 200, or 36 per cent, of the cases. In general the symptoms were similar to those in which hemothorax or pneumothorax was present, and the treatment was essentially the same. As in hemothorax and pneumothorax, the mortality was the same (approximately 6 per cent).

SUBCUTANEOUS EMPHYSEMA

Subcutaneous emphysema occurred in 40 per cent of the cases. As a rule the area was small and rapidly absorbed, and it required no special treatment. Occasionally the subcutaneous air spreads over the whole body and may cause pressure on the trachea and interfere with breathing. In one instance an ice pick wound at the angle of the scapula produced such a lesion. It was successfully treated by introducing a needle into the pleural cavity and aspirating the air by suction. Such lesions are probably caused by a laceration of the lung or bronchus, which produces a valvelike wound and allows air to escape into the subcutaneous tissues with each inspiration. Mediastinal emphysema occurs when pleural air escapes directly into the mediastinum and spreads upward into the neck and over the body. This condition is dangerous because of pressure on the trachea and should be treated by incisions in the suprasternal space. It occurred in one instance in this series on the twelfth day after operation for a stab wound of the heart. Aspiration of the air from the pleura was attempted, but the patient died two days later from tracheal compression.

INJURY OF THE HEART

Crushing injuries of the chest are frequently seen as a result of automobile accidents. Many are immediately fatal and are due to rupture of the heart, lungs or great vessels as a result of compression, or penetration of the viscera by sternum or broken ribs. Little attention has been paid to nonpenetrating heart lesions which are not fatal. Three instances have been previously reported by me [2] and it probably occurs more frequently than is supposed. Certainly there is no reason to believe that the heart, situated as it is between the sternum and the spine, is not subject to contusions of considerable severity and from which recovery takes place in the majority of instances. The most common cause of such an injury is one in which the driver is suddenly thrown forward against the steering wheel, and the sudden compression may injure the heart without fracturing the sternum or ribs. Any patient who is struck in the chest should be suspected of such an injury, particularly if symptoms of precordial pain, dyspnea and tachycardia are present. Persistence of these symptoms, together with irregularity of the heart, cyanosis and a peculiar "tick-tick" quality of heart sounds, makes the diagnosis almost certain. The treatment is entirely symptomatic. The chief reliance is to be placed on morphine and sedatives for rest, and on oxygen for dyspnea and cyanosis. The patient should be confined to bed until all symptoms have subsided.

Eleven patients, or 2 per cent, in this series had stab wounds of the heart and were treated by operation. All except one survived the operation, and six recovered. Five died from pneumonia or pericarditis, and one from mediastinal emphysema on the fourteenth day. The diagnosis of a wound of the heart is not difficult if the injury is suspected, as it should be in all lacerations of the chest. There is usually a history of freedom from any symptoms for several minutes; this is followed by collapse. External bleeding is profuse at first, but, with the stage of collapse, is checked. Both the collapse and the stopping of the hemorrhage are due to tamponade of the heart. The pulse is weak or absent, and the arterial pressure low or unobtainable. The venous pressure is raised, as may be determined by the manometer and as is evidenced by prominent strutted external jugular veins. Fluoroscopic examination is of aid, since in tamponade there is practically no cardiac movement.

INFECTION

Contrary to general opinion, infection of the pleura and of the thoracic viscera rarely follows penetrating wounds. Infection of the pleura in the form of empyema or infected hemothorax occurred in eight instances, or 1.4 per cent, of all cases. Knife and bullet wounds were equally responsible. Five followed hemothorax and three followed hemopneumothorax. Seven

2. Elkin, D. C.: Traumatic Lesions of the Thorax, South. M. J. **28**:4 (Jan.) 1935.

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of the eight patients recovered after rib resection and open drainage. One patient with bilateral chest wounds, produced with an ice pick, developed an abscess of the lung, which healed spontaneously. Ten patients died of bronchopneumonia, which was attributed to direct lung injury, although this complication occurs with such frequency after any operation that not all deaths can be said to be due to trauma; but they were so considered in estimating the mortality percentage.

CAUSE OF DEATH

Thirty-three patients, or 6 per cent, died as a direct result of thoracic injury or of complications resulting from the injury. The most common cause was shock and hemorrhage, which occurred in eighteen instances. Next in frequency was pneumonia (ten cases), infection (four cases) and mediastinal emphysema (one case). Of the four patients with infection, two died of pericarditis following operations on the heart, one of empyema and one of bacteremia.

Twenty-six patients with multiple injuries apparently died from causes other than those resulting from thoracic trauma and are not included in the mortality percentage. These included eighteen cases of peritonitis or hemorrhage from the abdominal viscera, two patients with hemiplegia from spinal cord wounds, three with massive hemorrhage from the neck or extremities, and one with a gunshot wound of the brain.

COMMENT

In this series of 553 cases of thoracic wounds, treatment was attempted by conservative methods. Except in wounds of the heart, operative procedures have been rarely carried out. Aspiration of blood or air has been practiced only in those patients having pain and dyspnea. With these methods the mortality was 6 per cent. One hundred and forty-eight patients were in shock and most of them had hemothorax or pneumothorax on entrance to the hospital. Treatment of this class of patient presented the most difficult problem and eighteen of them died, usually within the first twenty-four hours after admission, without reacting from shock. Some of that number might have been saved by operation. This would have necessitated open thoracotomy and lung suture. Had this method been carried out on a large number of patients, it is doubtful whether the mortality would have been as low as 6 per cent. Thoracotomy with exteriorization and extrapleuralization of the lacerated lung has been advocated and practiced by Connors and Stenbuck.[3] By this procedure they have unquestionably saved a number of lives, but their mortality in a small series of thirty-two cases was 12.5 per cent.

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ABSTRACT OF DISCUSSION

DR. FREDERICK CHRISTOPHER, Evanston, Ill.: Dr. Elkin's results have not to my knowledge been equaled. In a series of 553 cases treated by conservative methods the mortality has been only 6 per cent. Efforts to reduce this exceptionally low mortality will be centered on a study of indications for operative intervention. Dr. Elkin has employed surgical treatment in (*a*) the open sucking wounds, (*b*) compression or tension pneumothorax, (*c*) widespread subcutaneous emphysema with tracheal pressure, (*d*) mediastinal emphysema, (*e*) stab wounds of the heart, (*f*) large lacerated wounds of the lung, (*g*) severe hemorrhage from intercostal vessels, and (*h*) residual empyemas. In hemothorax only aspiration is employed for the relief of pain and dyspnea. When there is a possibility of a traumatic diaphragmatic hernia, electional intervention should be carried out later if the symptoms do not demand immediate operation. Bettman states that, in cases which are not immediately fatal, hemorrhage usually occurs from a bleeding intercostal artery. When this bleeding threatens to be serious, Bettman does a thoracotomy and checks the bleeding by a ligature which encircles the rib, thus compressing the vessel. Increasing hemorrhage may also come from a laceration of the lung. In traumatic hemothorax the advice of Foster and Prey is of interest. These workers contend that they have reduced the hospital stay 50 per cent by aspiration followed by artificial pneumothorax. Hedblom called attention to the fact that a traumatic empyema is of more serious import from the standpoint of both prognosis and treatment than the ordinary postpneumonic type. He said that complicating a pneumothorax with complete collapse of the lung results in infection involving the whole pleural cavity, thus rendering toxic absorption correspondingly greater. Contusion of the heart has been carefully studied by Beck, who called attention to the value of electrocardiograms in the diagnosis. The occurrence of ileus as a complication of rib fracture has been mentioned by Bettman and by myself. The autotransfusion of the patient's blood in heart wounds, as suggested by the Watsons, should be a valuable addition to the operative treatment. These authors stated in a paper published in THE JOURNAL that they removed the fluid blood from the pleural cavity by means of laparotomy pads, which they wrung out in 2 per cent solution of sodium citrate, and injected the blood into the patient by the intravenous method. Perhaps in no other injury is there the need for alert watchfulness that there is in thoracic injuries. Not only must there be careful observation, but a definite plan must be well in hand for taking care of the urgent sequelae. The man in general surgical practice will do well to keep in mind (*a*) the need of immediate closure of sucking wounds, (*b*) the ease of aspirating air from a tension pneumothorax when there is not excessive bleeding, and (*c*) that thoracotomy can be readily carried out with the ordinary modern gas machine and an intelligent anesthetist.

DR. L. WALLACE FRANK, Louisville, Ky.: The primary treatment of pleuropulmonary wounds resolves itself into the treatment of hemorrhage or the closure of sucking wounds of the chest wall and the relief of tension pneumothorax. Fortunately, the latter two conditions are infrequent, otherwise the mortality would be much higher. Most sucking wounds are larger than the opening of the larynx and trachea and hence immediate total collapse of the lung occurs and not infrequently mediastinal flutter with resultant marked circulatory distress. Such wounds must be closed at the earliest possible moment. Occasionally one observes a small oblique wound of the chest wall through which, as a result of a valvelike action, air is sucked into the pleural space with each inspiratory effort and at expiration the wound becomes closed. The pressure within the thorax mounts rapidly, the heart and mediastinal structures become displaced, circulatory and respiratory embarrassment soon become evident, and death rapidly supervenes unless the air is removed. In such cases the insertion of a moderate sized aspiration needle into the chest may be life saving. The treatment of hemorrhage in cases of pleuropulmonary injuries is seldom necessary. In hemorrhage from intercostal or internal mammary arteries, operative intervention is required. In many cases, a watchful waiting policy may be pursued. Should symptoms of marked intrathoracic pressure develop, some of the fluid may be aspirated. As a rule the increasing pressure stops the hemorrhage; this is particularly true when the bleeding comes from injury to the lung. Here conservative treatment may be followed. In such cases, however, frequent blood counts should be made and transfusion employed when indicated. At the end of ten days or two weeks, if the quantity of blood within the chest is large, as determined by x-ray studies, I remove the fluid by aspiration. I have seen empyema occur in cases of hemothorax as late as six months after the injury. Operative procedures for this condition may be prevented by early aspiration. When the hemothorax is small I prefer to wait for the possible absorption of the fluid. Should this not occur after a reasonable length of time, I remove the bloody fluid by aspiration. During the past two years, thirteen patients

3. Connors, J. F., and Stenbuck, J. B.: Penetrating Stab Wounds and Bullet Wounds of the Chest, Ann. Surg. 97: 258 (April) 1933.

with heart wounds were admitted to the Louisville City Hospital and ten of the cases were diagnosed. Eight patients were operated on and five lived. Two patients treated conservatively likewise made a satisfactory recovery. The indications for operative intervention in cardiac wounds are bleeding or cardiac tamponade. Before the Southern Medical Association last November, Bigger discussed heart wounds and emphasized an important point in the diagnosis of cardiac tamponade; namely, the absence of cardiac movement when the patient is studied fluoroscopically; this could probably best be demonstrated by roentgenkymography. This is more important than the size of the cardiac shadow. Tamponade is treated by pericardiotomy with the evacuation of the blood and suture of the wound, followed by closure of the incision without drainage.

TUMORS OF THE SPINAL CORD AND THEIR RELATION TO MEDICINE AND SURGERY

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Diseases of the central nervous system no longer carry the discouraging prognosis with which they formerly were associated. The two important factors responsible for this are the identification of certain lesions of the central nervous system with constitutional disorders, and the development of neurologic surgery.

The recognition of the neurologic aspects of certain systemic diseases and infections has been followed by a more specific type of therapy, which has proved both preventive and curative.

The advances that have been made in the treatment of syphilis, neurosyphilis, and the various infections that involve the central system, either primarily or secondarily, have increased the therapeutic armamentarium of the neurologist. A clearer conception of the toxemias and their neurologic phases, pernicious anemia and its treatment, diabetes, and other glandular dysfunctions has clarified many problems in neurologic therapy.

The first successful removal of a tumor of the spinal cord, by Horsley,[1] opened a new field of therapy for neurologic disorders that affect the spinal cord and exerted a profound influence on neurology, and on medicine in general. Following Gowers' diagnosis and Horsley's operation, a captain of the British army was transformed from a long suffering, helpless individual to an active person free from disability and pain. Following this epochal operation, two facts were impressed on the medical profession: first, that operable tumors really do exist and can be found, if looked for; second, that the early surgical removal of these tumors is followed by relief of paralysis, numbness and pain.

Tumors of the spinal cord are not rare, and as the years have passed since the first one was removed the number of these tumors that have been diagnosed and removed has increased. Similar to other pathologic conditions, the number of these tumors is increasing, not because the tumors are more prevalent than they were formerly, but because they are being recognized earlier and are being removed before the prognosis is hopeless.

The symptoms of tumors of the spinal cord are extremely interesting; while they may conform to a definite pattern, their protean manifestations make them an important factor in general diagnosis. Intraspinal tumors may masquerade for many years as syphilis, pernicious anemia, multiple sclerosis, syringomyelia, sciatica, arthritis, myositis or neuritis. These tumors may produce pain that is referred to the abdomen, pelvis and extremities. They may simulate appendicitis, cholecystitis, the twisted pedicle of an ovarian cyst, and fibromyomas, and they may produce such deformities as scoliosis, spasticity and paralysis.

Oppenheim [2] has described the symptoms of tumors of the spinal cord in a general way and has divided the clinical course into three stages. The first and longest stage is characterized by pain, which also is the earliest and most common symptom. In more than 300 cases in which the diagnosis of tumor of the spinal cord was proved at the Mayo Clinic, pain was present in approximately 80 per cent. The average duration of this symptom was considerably more than two years. The pain may be in the spinal column, at the site of the tumor. It may be referred to the lower extremities, even in cases in which the tumor is situated high in the spinal canal, but it usually is referred along the distribution of the posterior root of the spinal nerves and is known as "root" pain. It is the peripheral extension of root pain and its various qualities, such as aching, squeezing and piercing, that so frequently suggest disease of the pericardium, pleura, biliary, urinary, and gastro-intestinal tracts, peripheral nerves, muscles or bones. If pain is the first symptom, there may be an interval before any sensory or motor changes take place. This aids in making the diagnosis. One of the most important characteristics of the pain is that it may be worse on coughing or sneezing; it usually becomes worse at night, and the patient often will arise at an early hour in the morning and sleep in a chair.

The second stage in the development of the symptoms of tumors of the spinal cord has to do with the changes in motion and sensation. Numbness or peculiar sensory feelings may call the patient's attention to the sensory changes. This may be the initial symptom or may follow the pain. Sensory changes usually go hand in hand with motor changes. The classic Brown-Séquard syndrome may be present. This consists of diminution of power on one side of the body and sensory changes on the other. As the compression of the spinal cord persists and increases, the third or final stage develops. This consists of complete paralysis.

DIFFICULTIES OF DIAGNOSIS

In reviewing the records of patients who have been relieved of disabling symptoms by surgical removal of tumors of the spinal cord, at the clinic, it was extremely interesting to note the many problems that involved general medicine and surgery and continually presented themselves during the development of the symptoms and before a correct diagnosis could be made.

One of the most important considerations is that the lesion may be associated with a constitutional disorder, and for this reason a complete examination should be made. This, of course, should include the usual examination of the blood and urine, and the Wassermann reaction of the blood, and other serologic tests, if they are indicated. Roentgenograms have been of value in localizing tumors of the spinal cord in about 60 per cent of the cases, and for this reason good roentgenograms

From the Section on Neurologic Surgery, the Mayo Clinic.
Read before the Section on Surgery, General and Abdominal, at the Eighty-Seventh Annual Session of the American Medical Association, Kansas City, Mo., May 14, 1936.

1. Gowers, W. R., and Horsley, Victor: A Case of Tumour of the Spinal Cord; Removal; Recovery, M.-Chir. Tr. **71**: 377-428, 1888.

2. Oppenheim, Hermann: Weitere Beiträge zur Diagnose und Differentialdiagnose des Tumor medullae Spinalis, Montschr. f. Psychiat. u. Neurol. **33**: 451-493, 1913.

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of the spinal column and thorax should be made. A complete neurologic examination is necessary, for some small and apparently insignificant change in motor, sensory or reflex power may be of extreme importance in making a differential diagnosis. The examination of the cerebrospinal fluid is imperative, for not only are the physical characteristics important but the chemical and serologic changes may be the one clue to the correct diagnosis. Increase in the amount of protein, increase in the number of cells, a yellow color, changes in pressure, and response to changes of intracranial pressure, especially to compression of the jugular veins, should all be noted.

The examination of the cerebrospinal fluid is especially important whenever there is a question of syphilis, as there so frequently is in the majority of cases. I have been impressed by the number of cases in which a diagnosis of syphilis had been made and treatment started without conclusive evidence of the presence of this disease. Even in the face of a positive Wassermann reaction on the blood, the underlying cause of the symptoms sometimes may be a tumor of the spinal cord. The following case illustrates some of the diagnostic difficulties:

A man who came to the clinic had had slight stiffness in his legs for twenty years. Three years previously he had begun to drag his left leg, and three months later the right leg had become involved. About the same time he had begun to have cutting pains across the lower part of the abdomen, which had come on suddenly, had remained for about half an hour, and then had disappeared. His clumsiness and inability to walk had become so severe that, within a year, it had become necessary for him to use a wheelchair. This condition had continued until he came to the clinic. He also had had some difficulty in emptying his bladder.

The Wassermann reaction of the blood was strongly positive, and the reaction of the spinal fluid was negative. Roentgenologic examination of the spinal column did not reveal any abnormality. Neurologic examination revealed an almost complete paralysis of the lower extremities, with a loss of pain, temperature and tactile sensation below the level of the tenth thoracic segment. There was a complete loss of vibration and joint sensibility of the lower extremities. The lower extremities were found to be very spastic. During spinal puncture it was noted that the column of fluid in the manometer did not change position when the jugular veins were compressed; this denoted complete subarachnoid block. The progressive paralysis of the lower extremities, which had been present for two years and which had been associated with girdle pains, and the subarachnoid block had suggested a lesion of the spinal cord, which had been diagnosed and treated as syphilis because of the positive Wassermann reaction of the blood and in spite of the negative reaction of the cerebrospinal fluid.

A large, extradural hemangioma was removed through a laminectomy, which consisted of the removal of the spines and laminae of the sixth, seventh, eighth and ninth thoracic vertebrae. The tumor measured about 4 cm. in length, 2 cm. in width and 1 cm. in thickness. The patient made an uneventful convalescence and returned home without much improvement, except in vesical control. Two years later he returned to the clinic; at that time he was walking with only a slight amount of spasticity of the lower extremities and the Wassermann reaction on the blood was only slightly positive.

The striking features in this case were the onset of motor and sensory changes, which appeared before the pain; the positive Wassermann reaction of the blood, which indicated syphilitic infection; the negative Wassermann reaction of the cerebrospinal fluid, which made the diagnosis of syphilis questionable, and the marked improvement in all symptoms following removal of the tumor.

SYMPTOMS OF PERNICIOUS ANEMIA

Pernicious anemia is seldom confused with tumors of the spinal cord; however, Woltman[3] found that in approximately 12.7 per cent of cases of pernicious anemia that were seen at the clinic the patients came to the clinic for the express purpose of seeking relief from symptoms directly attributable to involvement of the nervous system. Chief among these symptoms were paresthesias, especially numbness and tingling of the hands and feet, which were present in about 80 per cent of all the cases of pernicious anemia, regardless of whether or not involvement of the nervous system could be demonstrated objectively. Occasionally a patient complained of a girdle pain (2.8 per cent) or the sensation of a tight band around the knees (1.7 per cent). A number of patients presented themselves for examination because of inability to control the arms and legs properly. Cramping of the calves occasionally proved to be the source of great discomfort. A patient may die of pernicious anemia without ever presenting any evidence of involvement of the central nervous system. On the other hand, the appearance of nervous symptoms may precede the onset of the anemia; this was true in 1.4 per cent of the cases seen at the clinic. The symptoms that preceded the anemia usually were paresthesias. The following case demonstrates how a tumor of the spinal cord may be mistaken for pernicious anemia:

A woman, aged 47, came to the clinic complaining of numbness and tingling in the toes, which gradually had extended to the legs and up to the thighs and had been getting progressively worse for two years. When the numbness first appeared she had been examined by her family physician, who found that she had a relative anemia and who made a diagnosis of pernicious anemia. He had administered hydrochloric acid and liver extract, which had improved the condition. In view of the fact that the condition had been diagnosed as pernicious anemia, with involvement of the central nervous system, a poor prognosis was given, and the patient and her husband had accepted this diagnosis and had become resigned to what seemed the inevitable outcome. However, as time progressed and the general condition of the patient had improved without any change in the numbness, the physician referred her to the clinic for diagnosis. A more detailed history revealed that about two months after the onset of the numbness and tingling she had noticed some difficulty in walking in the dark, and as the condition had progressed she had been unable to feel the floor with her feet. Occasionally she had fallen down. The legs gradually had become stiff, and she had noticed that she could not walk as fast or move as quickly. The patient's condition had become steadily worse during the previous four months, and at the time of her examination she was afraid to go out alone. She never had had any pain or incontinence of urine or feces.

Examination of her blood revealed that the value for the hemoglobin was 89 per cent and that there were 4,290,000 erythrocytes and 7,500 leukocytes in each cubic millimeter of blood. The gastric acidity was within normal limits. The roentgenologic examination of the thoracolumbar portion of the spinal column revealed slight thinning and flattening of the pedicles of the sixth and seventh thoracic vertebrae, on the left side. The rest of the general examination did not reveal any abnormality.

Neurologic examination revealed almost complete loss of pain, tactile and temperature sensation up to the level of the eighth thoracic segment. There was a loss of vibration and joint sense in the lower extremities. There was mild loss of strength in the lower extremities and there was some spasticity. Ankle clonus was found bilaterally, but there was a loss of epigastric, midabdominal and hypogastric reflexes. Chaddock's and Rossolimo's reflexes were present on both sides. Examination

3. Woltman, H. W.: The Nervous Symptoms in Pernicious Anemia, Minnesota Med. 2: 306-310 (Aug.) 1919.

of the spinal fluid revealed 160 mg. of total protein per hundred cubic centimeters of spinal fluid, a positive globulin test, and 3 small lymphocytes per cubic millimeter of spinal fluid. There was a definite delay in the rise and fall of the fluid in the manometer following compression of the jugular veins. Because of the anesthetic level, the roentgenologic changes and the partial subarachnoid block, a diagnosis of tumor of the spinal cord was made. Operation revealed a large meningioma, which measured 2.5 by 1.5 by 1.5 cm., situated opposite the sixth thoracic segment. The tumor was removed completely, with its base. Following the operation the patient had an uneventful convalescence, and at the time of her dismissal from the clinic there was marked improvement in her sensation and a lessening of the spasticity. A letter received from the patient six months after she had returned home revealed a loss of all disability and complete return of normal sensation and function of the lower extremities. When she was examined two years later there was no evidence of any previous trouble.

There is no physiologic reason why certain constitutional diseases cannot occur simultaneously with the development of the symptoms of a tumor of the spinal cord, but the foregoing case has been presented to show how difficult a differential diagnosis can be when the symptoms of the tumor are so atypical that they simulate the neurologic manifestations of another disease.

PRESENCE OF TUBERCULOSIS

Tuberculosis of the central nervous system usually is preceded by a demonstrable focus in some other part of the body, or, if it involves the spinal cord, there usually are associated bony changes which are demonstrable in the roentgenograms. Further, if the tuberculous lesions are within the meninges or involve the nervous tissue, the prognosis is very bad. However, tuberculomas of the spinal cord may be present without any evident focus elsewhere in the body. They may be removed surgically and all symptoms may be relieved when they are extradural and the dura remains intact during the removal. The following case emphasizes the justification of operation following a rapid course, and in the face of a poor prognosis. Further, it proves that tuberculosis encountered early in the operation should not deter an attempt to remove all granulomatous tissue, and the fact that the patient was well six years after operation indicates that a cure had been effected.

A youth, aged 19 years, came to the clinic complaining of paralysis of the lower extremities. He had had pneumonia two years previously, and after recovery he had been perfectly well until six months previous to his registration at the clinic, when he had influenza associated with a cough and pains in the thorax, and some elevation of temperature. He had recovered in about a month and had been perfectly well until four weeks previous to his registration at the clinic, when a dull pain had developed in the upper part of his thorax and back. This had been associated with a dry cough, which had increased the pain. Two weeks later, after the pains in the thorax had decreased, he had noticed numbness in his legs, which had extended up to his knees. This had been very slight at first but gradually had become worse, and in three days it had extended to his hips. With the subjective numbness he had lost all sensation and all ability to move his legs; this loss of function had become complete in four days. In one week following the onset of his symptoms he had become completely paralyzed below the waist; the paralysis had been associated with a complete anesthesia. Some difficulty in voiding also had developed. Roentgenologic examination of the thorax showed some small localized infiltrations, which were thought to be the result of localized bronchiectasis. Examination of the thoracic vertebrae did not disclose any abnormality. Neurologic examination revealed a complete paralysis of the muscles below the level of the eighth and ninth thoracic segments, and a complete loss of sensation, vibration and joint sensibility below the sixth and seventh thoracic segments. The cerebrospinal fluid proved to be yellow, and it coagulated immediately. There was no response to jugular compression. A diagnosis of transverse myelitis was made, and because of the age of the patient and the sudden onset a laminectomy was advised, in spite of a very poor prognosis. In the course of the operation an inflammatory lesion of the muscles was encountered; microscopic examination revealed that this lesion was tuberculous. The epidural space was found to be filled with a granulomatous mass, which seemed to encircle the spinal cord, although the largest portion was compressing the cord from the posterior aspect. The entire inflammatory mass was removed, and the wound was closed. The patient had an uneventful convalescence. The wound healed by primary intention, but there was little or no return of function of the lower extremities, although the function of the sphincters had improved definitely. The patient returned home and remained in a wheelchair for six months; at this time he was able to be up and about on crutches. At the end of a year he was able to walk without any difficulty. He returned to the clinic for reexamination six years later, in 1936, at which time he was perfectly well. Roentgenologic examination of the spinal column did not reveal any further involvement with tuberculosis, and he had made a splendid recovery.

MALIGNANT TUMORS

The foregoing case and the next case have a short history in common, and yet they are so different that they illustrate many points in contrast. The rapid development of symptoms of tumors of the spinal cord always raises the question of malignancy and, surprisingly enough, both primary and secondary malignant tumors of the spinal cord occur so infrequently that, even in the presence of malignant changes elsewhere in the body, experience has shown that surgical exposure of the tumor to make a differential diagnosis is justified. In the following case, the diagnosis of syphilis also had been made on account of a positive Wassermann reaction of the blood, and there had been a questionable diagnosis of metastasis of carcinoma of the breast, which had been removed four years previously. To confuse the diagnosis further, the patient responded temporarily to antisyphilitic treatment, which is difficult to explain in the light of the tumor that was found at operation.

A woman, aged 55, came to the clinic complaining of coldness of the lower extremities, loss of sensation, difficulty in voiding, and shooting pains in the thorax. She had undergone a radical mastectomy four years previously for carcinoma of the breast. Three months before her registration at the clinic she had noticed a numbness and dead feeling in both feet. Two or three weeks before she was examined, she had had difficulty in voiding. A roentgenogram of the spinal column did not reveal any abnormality. The Wassermann reaction of the blood was markedly positive, but that of the spinal fluid was negative. The neurologic examination revealed a weakness of the lower abdominal muscles and the muscles of the lower extremities, a decreased sensibility to pain and temperature over the lower extremities, and a decrease in joint and vibration sensibility. Because of the positive Wassermann reaction of the blood and because of the previous carcinoma of the breast, a diagnosis of myelitis that was the result of one or the other condition was made, and the patient was allowed to return to her home, after antisyphilitic treatment had been advised. She received treatment at home, and while she was being treated the numbness improved and she was able to drive a car and walk. This treatment was continued for eight weeks. Two weeks after the treatment was discontinued, the numbness of the legs increased and it became difficult for her to walk. Her condition gradually became worse until she was confined to her bed and was unable to move even her toes. She returned to the clinic for reexamination; at this time there was almost complete paralysis of the lower extremities, and a definite sensory level could be demonstrated corresponding to the sixth thoracic segment. Examination of the spinal fluid proved that the Wassermann reaction was negative; there was a positive subarachnoid block. Roentgenologic examination of the spinal column did not reveal any evidence of metastasis. Laminec-

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tomy was performed; a large meningioma was found opposite the fourth interspace. It was attached to the right side of the spinal cord, which was compressed to about a fifth of its normal size. The tumor, which was removed with its dural base, measured 3 by 2.5 by 1 cm. An uneventful convalescence followed, and there was a gradual restoration of both sensory and motor functions of the lower extremities; at the expiration of seven months the patient was walking about.

Like metastatic lesions of the spinal cord, primary malignant tumors of the spinal column and contiguous tissues are infrequent, and even if there is evidence of destruction of the bone in the roentgenograms it sometimes is advisable to operate and remove as much of the tumor as is possible and then employ radiation therapy in an attempt to relieve the compression of the spinal cord and to control the growth of the tumor. Following this type of procedure, the results are sometimes more than gratifying, as illustrated by the following case:

A youth, aged 20 years, came to the clinic complaining of difficulty in walking, which had been present for the previous year and a half. At the onset of his trouble he first had noticed pain just under the left scapula. The situation and level of the pain had remained constant. The pain had extended anteriorly as far as the anterior border of the axilla. It had been worse at night than it had been during the day, and it had become more severe when he coughed or sneezed. The pain had continued without change for one year, when he had noted stiffness about the hips, and a periodic dragging of the left leg, which had been associated with numbness. One month previous to his examination at the clinic his legs had become very stiff and weak, and he had been unable to get up and about. Roentgenologic examination of the spinal column revealed slight scoliosis of the upper thoracic vertebrae, an irregular mass which involved the left side of the lamina of the third thoracic vertebra, and destruction and proliferative changes, which caused a diagnosis of questionable osteochondroma to be made. The neurologic examination revealed weakness of the muscles of the back and lower extremities below the eighth and ninth thoracic segments, an increase in reflexes of the lower extremities, and the presence of ankle clonus. Babinski's reflex was present on both sides and there was evidence of marked incoordination and spasticity. There was almost complete loss of sensation below the level of the second thoracic segment, and there was loss of vibration and joint sensibility in the lower extremities. Lumbar puncture did not reveal any change in the pressure of the cerebrospinal fluid, following compression of the jugular veins. Because of the subarachnoid block and the localizing level, laminectomy was performed. This revealed a bony mass between the spinous processes of the third and fourth thoracic vertebrae. Microscopic examination revealed that the tumor was an osteogenic sarcoma. The laminectomy was completed by removing the spines and laminae of the third and fourth thoracic vertebrae. A discrete mass could be seen lying on the left side and compressing the cord opposite the intervening interspace. The entire mass was removed, although the adjacent bone was involved in the process. Following the healing of the wound, the patient was given one course of high voltage roentgen therapy in four treatments. He returned to the clinic six weeks later for a second course of roentgen therapy. At that time there was subjective and objective evidence of definite improvement. He was able to walk, but some spasticity still was present and he still complained of pain which was induced by coughing or sneezing. He again returned to the clinic six weeks later; at that time it was found that the improvement had continued and that the loss of sensation extended only to the level of the hips. Vibration and sensibility had begun to return, and the spasticity had decreased. He was given a third course of high voltage roentgen therapy. When he returned to the clinic seven months later, examination revealed that his condition had returned to normal. At this time roentgenologic examination of the spinal column revealed some proliferation about the left lateral margin of the laminectomy wound, but there was no evidence of a tumor.

SYMPTOMS OF ARTHRITIS

Among the more common general conditions with which tumors of the spinal cord may be confused is arthritis. In many cases in which a tumor of the spinal cord is suspected, the only demonstrable lesion in the roentgenograms of the spinal column consists of hypertrophic changes in the vertebrae. Sciatica and pain in the lower part of the back sometimes constitute the only symptoms for a long time, and the diagnosis can be made only after very careful study. Hench [4] has called attention to the fact that, in any case of arthritis in which morphine or codeine is required to relieve the pain, a tumor of the spinal cord should be suspected.

A woman, aged 45, came to the clinic complaining of pains, which were situated over both sacro-iliac regions and which extended down to the ankles. She had had acute rheumatic fever at the age of 8 years, and four years before her examination at the clinic she had had an attack of arthritis, which had involved the knees, wrists and fingers. Two years previous to her examination she had had an attack of severe pain over the sacro-iliac joints; since that time she had had periodic attacks of pain, which had extended to the buttocks, groins and pelvis. There also had been some pain in both ankles. These attacks had lasted two weeks and then had disappeared. The attacks, however, had become more frequent and had appeared closer together; the last attack had kept her awake for three nights.

Roentgenologic examination of the spinal column revealed some hypertrophic changes about the sacro-iliac joints. The neurologic examination did not reveal any abnormality. She was hospitalized to be treated for arthritis but, because the pain became so great when she was in bed, a spinal puncture was done to rule out the possibility of a tumor of the spinal cord. The cerebrospinal fluid was yellow and there was a complete subarachnoid block. Following the spinal puncture there still were no localizing signs, and for that reason, 5 cc. of iodized poppy-seed oil was injected into the subarachnoid space through the posterior cistern. Roentgenoscopic examination revealed that the iodized oil had descended to the level of the twelfth thoracic and first lumbar vertebrae. The column of oil was divided, and in the subsequent roentgenogram a definite tumor could be outlined. For that reason a laminectomy was performed. This involved the twelfth thoracic and the first, second and third lumbar vertebrae. Large multiple neurofibromas were found attached to the second lumbar root. Following the operation the patient made an uneventful convalescence and the pain was completely relieved.

PAIN

Of extreme interest to general surgeons should be the painful syndrome of tumors of the spinal cord, because it is in this phase of development of these tumors that the patients usually insist on having something done to relieve the pain. The gallbladder or appendix always is suspected of causing pain that extends to the upper or lower right quadrant of the abdomen, and pain that extends to the pelvis may be associated with an ovarian cyst or a fibroid; but after the suspected lesion is removed, pain is still present. What really emphasized this feature of tumors of the spinal cord was the following case:

A man came to the clinic because of pain, which extended to the region of the gallbladder. A diagnosis of cholecystitis was made in the face of negative results of the general and neurologic examinations. This was based on the distress after eating and on the positive roentgenologic evidence of disease of the gallbladder. The pain persisted following cholecystectomy, and no explanation could be found for the persistence of the pain. When he returned to the clinic six months later, there was an unmistakable Brown-Séquard syndrome, which

4. Rynearson, E. H., and Hench, P. S.: "Rheumatism" That Requires Morphine, M. Clin. North America **15**: 153-161 (July) 1931.

indicated that the trouble was within the spinal canal. A large intradural extramedullary neurofibroma was removed, and there was complete cessation of symptoms.

It was interesting to note that 10 per cent of the patients who have been subjected to operation for tumors of the spinal cord had been operated on previously for the relief of the pain or disability. To emphasize this point further, two cases are presented briefly, as they both have been reported previously.

The first case does not differ in many respects from countless others in which pain extends to a region in which examination reveals a local lesion. In the absence of any neurologic signs, there was little reason to suspect a tumor of the spinal cord in this case, except that the pain was relieved by exercise:

A woman, aged 37, came to the clinic complaining of an intermittent drawing pain, which was situated in the left lower part of the thorax and in the abdomen and had been present for two years. The pain had been increasing in severity; it had not responded to any type of treatment, but it had been relieved by exercise. Six months after onset of the pain, examination had revealed the presence of an ovarian tumor and laparotomy had been performed for relief of the pain. Because the pain had been projected at times to the right side of the abdomen, not only a left cystic ovary and the corresponding fallopian tube had been removed but the appendix also had been removed. In the course of convalescence the pain had returned with the same severity. No obvious cause could be found for the pain, but about six months after operation the patient had noticed a drawing pain in her left leg and some weakness of the muscles of both legs. Examination at the clinic two years after the onset of pain and a year and a half after operation revealed sensory and motor changes corresponding to disturbance of the right thoracic segment. Removal of an endothelioma of the spinal cord relieved the weakness, anesthesia and pain.

Tumors that affect the lumbar portion of the spinal cord are the most difficult to diagnose and localize. In this region a tumor may produce pain, weakness, atrophy or all three, for a long time, with no other objective evidence. When a tumor of the spinal cord is not suspected, restorative measures are sometimes carried out.

A man, aged 43, came to the clinic complaining of an aching distress in the sacro-iliac region, which had extended down the left thigh and had been present for three years. Six months after the onset of pain, atrophy had developed in the left thigh and leg; this had resulted in marked weakness and disability of the parts affected. The pain had persisted, had been variable in nature, and had been intermittent. Two and a half years after the onset, the pain had proved of little consequence in comparison to his disability, for which he sought relief. In spite of the pain, a diagnosis of residual poliomyelitis was made and a tendon transplantation was done. This operation seemed to cause gradual increase in severity of the pain, until the patient was unable to sleep in bed. It was necessary for him to sleep in a chair. Examination, which was conducted six months after operation, revealed marked weakness below the gluteal muscles on the left side, and some weakness on the right side. The patellar and the achilles reflexes were absent on both sides. There was loss of pain, temperature and tactile sense over the left calf. The cerebrospinal fluid was yellow and there was no change in pressure following compression of the jugular veins. At operation, multiple neurofibromas, which extended from the first to the fifth lumbar vertebra, were removed. This operation caused the symptoms to disappear.

COMMENT AND SUMMARY

Tumors of the spinal cord may simulate other neurologic lesions or the neurologic manifestations of constitutional diseases or infection. The painful syndrome, which is present in 80 per cent of the cases, may persist for months or years and may simulate diseases of the pericardium and pleura, diseases of the biliary, urinary and gastro-intestinal tracts, and diseases of the peripheral nerves, muscles and bones. The majority of tumors of the spinal cord are benign and operable. If tumors of the spinal cord are removed before they produce irreparable damage to the spinal cord, a restoration of function almost always follows. Operation for the removal of tumor of the spinal cord is attended with a mortality of less than 4 per cent.

ABSTRACT OF DISCUSSION

DR. ERNEST SACHS, St. Louis: Dr. Craig has emphasized the early diagnosis and has pointed out and given striking examples of cases that were readily confused with some other type of condition. In going over our series of spinal cord tumor cases with this particular idea in view, I noted that whereas in the typical spinal cord tumor case pain is one of the earliest symptoms, there were a number of cases in which pain was not the initial symptom. Many of these patients gave a history that after seeing their physicians and obtaining no relief they had gone to quacks, osteopaths or chiropractors. The first symptom that these patients complained of was a peculiar paresthesia. However, owing to the fact that the general physician doesn't devote much time to a careful neurologic examination, the slight changes in the nervous system had not been noted. One patient, the brother of a physician, presented himself with the symptom of painful urination and difficulty in emptying the bladder. The physician concluded that the difficulty was due to some prostate trouble and removed his prostate without any relief. I saw the patient shortly afterward and at that time he had almost complete retention. The only neurologic symptom he had other than the bladder disturbance was saddle anesthesia. In an ordinary physical examination this can be readily missed. The patient had a large extradural fibroma of the lower portion of the spinal cord. On removal of the tumor the patient's symptoms completely cleared up. Another patient was a woman who complained for over a year that she could not take a cold bath and that whenever she got any cold water on her abdomen it produced excruciating pain; this was considered a neurosis. I saw her repeatedly and made sensory examinations suspecting a spinal cord tumor, but I wasn't able to arrive at any definite decision until instead of making sensory examinations with cotton and a sharp needle I used a piece of ice, when it was perfectly easy to establish a definite line of changed sensation on one side of her abdomen. She had a neurofibroma growing from one root. With its removal these paresthesias disappeared. There is no relationship between prolonged neurologic symptoms, compression of the cord, and the possibility of the spinal cord recovering after long compression. All have seen cases in which a spinal cord has been compressed for a long time and was almost ribbon-like in character, yet such a patient might recover completely, while other patients who have comparatively slight compression of the cord may not recover their motor or sensory functions to any extent.

[DR. WINCHELL MCK. CRAIG, Rochester, Minn., showed moving pictures of a patient before and after operation, presenting the classic symptoms of tumors of the spinal cord. The picture showed preoperative examination, drawings of the operation, and postoperative examination showing partial recovery after an interval of twenty-one days. Complete recovery was shown after an interval of three months.]

Body Fat.—A superfluity of food leads either to indigestion or to undue fatness—sometimes to both. Too meager a food intake depletes the body of such stores of fat as it should normally carry. Body fat has important functions: it constitutes a reserve supply of fuel; it serves as a support for some of the internal organs, notably the kidneys; and it may at times be of great service in protecting parts of the body from bruises or from cold.—Sherman, H. C.: Food and Health, New York, Macmillan Company, 1934.

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BASAL MENINGITIS

SOME CONSIDERATIONS AND A PROPOSED MANAGEMENT

FERRIS SMITH, M.D.
GRAND RAPIDS, MICH.

I have been impressed, during a period of many years, with the variation of the postmortem picture at the base and on the cortex after meningeal death. All physicians have noted many times the well organized exudate at the base of the brain and the thin, flocculent, purulent exudate that covers the pia in the sulci and on the surface of the brain. It was certainly twenty-five years ago that I was first struck with this observation, but it has only been within recent years that I have been impressed with the significance of it.

This well organized exudate represents the point of entrance of the infection and nature's effort to confine it. It is the sign post pointing to the field which is to be considered here. The floor of this involved area is the roof of the posterior ethmoidal cells, the sphenoid sinuses and the basilar process of the sphenoid bone.

The essential anatomy of this region must be carefully reviewed, some teachings in relation to it discarded, and a mental picture of the circulation of the area acquired in order that the sequence of events which lead to a meningitis may be fully appreciated.

It has been taught that the principal blood supply of the sphenoid sinus comes from branches of the vessels supplying the pharyngeal mucosa as this structure follows pneumatization to line the cavity. Physicians have further been led to believe until recent years that there was no connection between this blood supply of the cavity lining and the intracranial structures. Nothing can be further from the truth (fig. 1).

Breschet in 1837 fully demonstrated the circulation of the base and of the vertebra. If the occipital and sphenoidal bones may be regarded as the first two segments of the vertebra, there will be no difficulty in picturing its blood supply. The arrangement is apparently identical with that of the vertebral segments. There is free communication between the vessels of the sphenoidal lining and the haversian systems of the basilar process and between these systems and the dura, which dips through the cortex of the bone to connect with parts of this arrangement in the marrow. Logan Turner [1] clearly demonstrates this in his studies of the pathways of infection. There are numerous fine veins which terminate in the dura or join the basilar veins and do not traverse the arachnoid to the pia mater. There are other veins which pass either directly or indirectly to the latter structure. Secondly, there is direct vascular communication between the cortical bone on the roof of the sphenoid and its dural covering. Thirdly, there is free communication between the veins of the sphenoid lining and the basal venous pools both directly and through the pterygoid plexus and its branches connecting with the cavernous sinus. These venous lakes at the base of the brain, that is, the cavernous sinus, the circular sinus, the basilar plexus, the inferior petrosal veins, and so on, are all parts of one system, which have been variously named.

The perilymphatic sheaths of the arteries at the base are arachnoid prolongations which follow them to their terminations.

The consideration of the cisterns at the base is essential. These again are variously named but are in fact interconnecting and intimately related. The basal cistern is the space between the arachnoid and the pia mater resulting from failure of the arachnoid mater to follow the surface of the brain across the base from one temporal lobe to the other. Included in this is the pontine cistern, which is a similar space just anterior to the pons; also the chiasmal cistern resulting from a similar failure of the arachnoid to follow the surfaces of the branches of the optic chiasm. This basal cistern connects posteriorly with the cerebellomedullary cistern or the cisterna magna. It is in the area of this so-called basal cistern that one notes the old, well organized exudate in the fatal meningitis case of basal origin. This is obviously the point of entrance of the infection.

Pickworth [2] has demonstrated organisms in the sphenoid lining and similar organisms in the haversian veins, in the bone cortex, in the dura, in the capsule and substance of the pituitary gland, in the perilymphatic sheaths of the arteries, in the artery walls and in the perineural sheaths of the base.

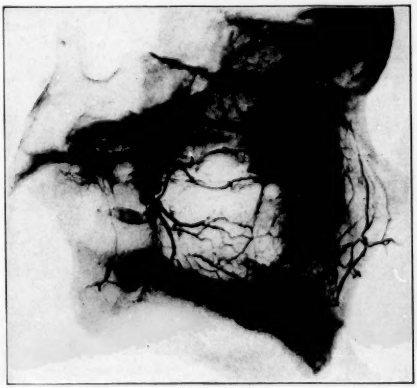

Fig. 1.—Injection of the sphenopalatine artery, illustrating the absence of demonstrable branches supplying the sphenoidal sinus lining. (Preparation made by Dr. William C. Meloy while a member of the author's staff.)

With this definite picture of the modes of entrance of infection in mind, one has only to consider the physiologic and pathologic processes that follow an extension of infection from the sphenoidal cavity in order to complete the picture. The organisms may extend by continuity, on the one hand, or be carried through the veins by a process of thrombophlebitis, on the other. There may be presented an osteoporosis, an osteitis or an osteomyelitis in the early stages. Either of these invasions may continue until the veins of the dura and the basilar plexus are included in the process. It is at this point that the physiologic action of the pia arachnoid produces a barrier, more or less temporary, depending on the virulence of the infection, to the further extension of the disease process. Eagleton [3] points out that "this frame work is not only a barrier, but also contains a protective mechanism, so that any infection which may pass the barrier of the

1. Turner, A. L., and Reynolds, F. E.: J. Laryng. & Otol. **41**: 73-86 (Feb.), 442-453 (July), 717-731 (Nov.) 1936; **43**: 34-41 (Jan.) 565-573 (Aug.) 1928.

2. Pickworth, F. A.: Chronic Nasal Sinusitis and Its Relation to Mental Disorder, London, H. K. Lewis, 1935.

3. Eagleton, W. P.: The Philosophy of Meningitis, Laryngoscope **39**: 627 (Oct.) 1929.

dural covering, or which may be brought to the brain by the circulatory blood, will be instantly counteracted, digested and removed." He states further that "if we are to understand meningitis, we must understand this frame work, this barrier, this protective mechanism, this phagocytic membrane, not only in its gross anatomy, but also in its microscopical physiology and especially its reactions in the presence of an irritant, via trauma, cold or micro-organisms."

Fig. 2.—X-ray study of the base showing an early osteomyelitis involving the basilar process and the occipital articulation. There is beginning bone absorption and rarefaction. There is marked opacity in the sphenoid sinus.

For the purposes of the present consideration, I regard its function as parallel to that of the peritoneum or the pleura. Just as the peritoneum walls off an early purulent appendix, or the pleura walls off a purulent collection, so the pia arachnoid of the basal cistern adheres to the dura and limits for the time being the extension of an invading infection. It is because of this physiologic action that the old, well organized exudate at the base is found. It is only when the infection involves the veins or follows the arterial sheaths traversing the pia that the barrier is broken down and that the infection produces a fatal leptomeningitis.

The interest of the physician centers in the events from the moment of initial infection to a time prior to the extension of the infection beyond this circumscribed area. There is a period, depending on the virulence of the invading organism, of from one to forty days in which to recognize the situation and carry out its management.

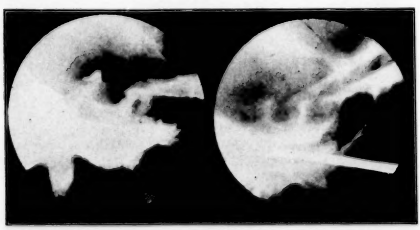

Fig. 3.—Illustrating conditions present in figure 2 and the position of the burr in draining the pontine cistern.

The clinical picture is definite and typical. It is frequently ushered in by a feeling of malaise, a dull, heavy sensation behind the eyes, or an orbital neuralgia. There may also be pain in the supra-orbital, malar and mandibular regions. As the disease progresses, the patient lies on his back, with his eyes closed, in a state of semicoma, from which he is easily aroused. He may or may not complain of pain in the neck but does not have stiffness of the neck until the cisterna magna becomes involved. Repeated examination reveals an intermittent, recurrent, vertical nystagmus and occasionally similar behavior in the horizontal plane. There may be paresis or paralysis of the sixth nerve. There is a slight elevation of temperature and a moderate leukocytosis. The spinal fluid is under slightly increased pressure, is usually cloudy and presents an increased cell count. There may or may not be bacteria in the fluid at this stage.

It becomes apparent that during this distinct phase of the disease any management which will afford free drainage and the restoration of normal circulation offers the possibility of saving many lives which are now almost invariably lost. The requirements will consist of drainage of the basilar process of the sphenoid or of such drainage, plus drainage of the basal cistern, according to the extent of the disease.

I present for consideration two methods of approaching this problem and the outcome of three such surgical attempts.

CASE 1.—E. M., a woman, aged 33, an anesthetist, who entered the hospital May 24, 1933, had pansinusitis over a period of fifteen years. There were twelve operative procedures for relief of empyema, frontal abscess and exacerbations of osteomyelitis during this period.

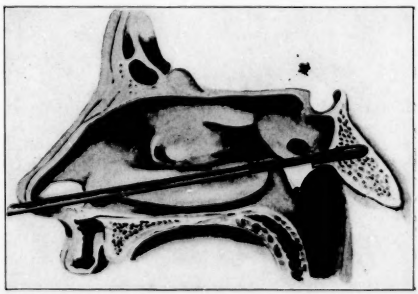

Fig. 4.—Position and direction of the burr for drainage of the pontine cistern. See figure 3.

The present condition began with a coryza ten days previously. The first complaint was headache of a mild character. This was soon complicated by several days of intermittent "aching" and pain behind the eyes, lassitude and malaise. The retrobulbar pain increased in intensity until it could not be controlled by opiate, and tribrom-ethanol was required for the patient's rest.

There was a temperature from 97 to 99.5 F., with a pulse rate of 100. The patient remained flat on her back. She was drowsy but easily aroused and she complained of pain in the occipital and upper cervical region. She preferred a darkened room because of a mild photophobia. She presented an intermittent, spontaneous vertical nystagmus. The spinal fluid was under slight pressure, slightly cloudy and contained 1,800 cells. The leukocytes numbered 17,250, with 91 per cent polymorphonuclears, 7 per cent large lymphocytes and 1 transitional cell.

The involvement of the sphenoid sinus, the basilar process of the sphenoid and the articular process of the occipital bone is illustrated in x-ray studies shown in figures 2 and 3.

The rapid development of the symptoms and the fluid changes demanded immediate action, if any were to be taken. A choice had to be made between two long contemplated approaches.

An intranasal trans-sphenoidal route was selected because of the chronicity of the history, the fact that the opposite cavity had been the site of complete surgical operation for chronic disease, and the apparently old pathologic condition in this sphenoidal cavity, which demanded removal as well as an adequate drainage of the basilar process and basilar cistern.

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The sphenoidal cavity and the bony floor were treated as previously described.[4] A burr of three-sixteenths inch diameter was introduced in the midline at an angle directed toward the middle third of the pons (fig. 4). The burr was driven into the bone for three-eighths inch and then exchanged for a slightly smaller one. This provided a stop for a tube to be introduced after the dura had been opened.

The smaller drill was driven through the medullary and superior cortical bone to the dura. The drill was removed and

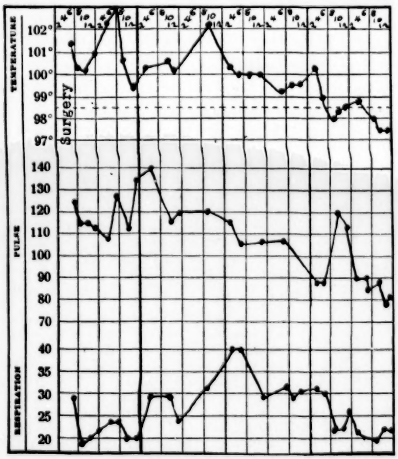

Fig. 5.—Temperature, pulse and respiration in case 1.

the dura opened. A soft tube, having the same diameter as the initial drill (three-sixteenths inch), was passed through the nose and into the drill hole. This was clamped external to the nostril.

The sudden loss of fluid when the dura was opened, plus the local trauma, caused an immediate marked disturbance of respiration and pulse. This corrected itself shortly after the clamping of the tube and stimulation by carbon dioxide.

There was a sharp increase in the temperature, pulse and respiration a few hours after the operation and a gradual decline to normal during the subsequent three days. These variations probably resulted from the trauma and the presence of a small quantity of free blood (fig. 5). The blood pressure showed little variation (118/68). The patient was very restless and complained of intense general headache for forty-eight hours. The pain about the left eye disappeared during the first twenty hours. She was nauseated and continued to complain of pain in the vertex and occiput for several days. She was discharged on the tenth day.

In the following cases drainage was accomplished through a transoral approach (fig. 6). This is less technical (less time consuming) and should meet the requirements of most cases. The velum is incised from the posterior margin of the palate bones to the base of the uvula. The proximal end of this incision is continued laterally on both sides along the edge of the palate bones to the hammular processes. Retraction of the incised velum exposes the vault of the nasopharynx —the basilar process of the sphenoid bone and its occipital articulation. A T shaped incision is made in the midline, and the soft coverings are separated to expose the bone just posterior to the rostrum of the vomer (fig. 7). The sphenoid cavity is opened from below.

4. Smith, Ferris: Management of Chronic Sinus Disease, Arch. Otolaryng. **19**: 157-171 (Feb.) 1934.

The drilling and subsequent procedure are carried out as described in case 1. There is much less danger of injury to the internal carotid arteries in this approach than in the trans-sphenoidal one. The operation is concluded by closure of the velum with horsehair sutures.

CASE 2.—P. E., a boy, aged 6, admitted Jan. 21, 1934, had an infection of the upper respiratory tract eighteen days before admission. Acute suppurative otitis media developed three days later. Intermittent drainage occurred from the ear and, later, spontaneous drainage through an old mastoidectomy scar. The patient was very irritable and complained of frontal and occipital headache with stiffness of the neck.

There were increased muscle tonus in both upper and lower extremities; hyperactive biceps, triceps, knee and achilles reflexes; positive Kernig's sign; stiffness of the neck with pain on motion; normal extra-ocular muscle and pupillary action; acute suppurative otitis media and suppurative mastoiditis (left). The spinal fluid was under normal pressure and was cloudy; it contained 1,440 cells; the phenol test was +++; Nonne-Apelt tests were +++ and ++, with no organisms on smear and culture. The temperature was 103, pulse 118. Leukocytes numbered 15,150, with 88 per cent polymorphonuclears. Blood culture was negative. The urine had a specific gravity of 1.024; albumin +; leukocytes 25. Culture from the ear yielded Staphylococcus aureus.

I saw this patient in consultation with Dr. Lee Grant twenty-four hours later. The clinical picture was only slightly changed. There were marked photophobia, no rigidity of the neck, a spinal fluid cell count of 630 and no bacteria. X-ray examination of the mastoid that had been operated on revealed the presence of cells over the entire mastoid and in the root of the zygoma. The operative note of Dr. Grant on this date stated that considerable necrosis had occurred in the area of the middle ear and the mastoid antrum. Infection was present throughout the mastoid, with areas of sclerosis. Marked regeneration of cells followed the previous operation.

There was a slight remission in fever, cessation of drainage and some general improvement for a few days following this operation.

I again saw the patient in consultation seven days later. He complained of pain behind the eyes and photophobia. He presented both a spontaneous horizontal and vertical nystagmus, no

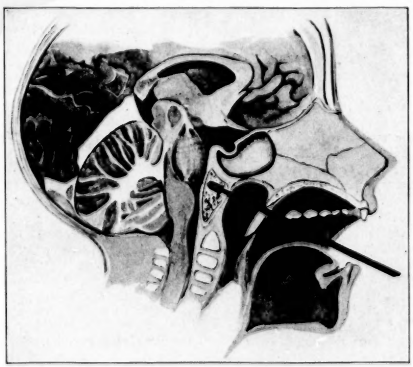

Fig. 6.—Position and direction of the burr for the transoral drainage of the pontine cistern.

weakness of the extra-ocular muscles, slight stiffness of the neck, and a positive Kernig's sign. The leukocytes numbered 28,650, with 88 per cent polymorphonuclears. The spinal fluid was under slightly increased pressure, was cloudy and contained 1,920 cells. The sediment presented a very occasional pair of gram-positive cocci. There was no growth on the culture at the end of twenty-four hours and a few colonies of hemolytic streptococci at the end of forty-eight hours. I advised further

exploration of the mastoid and drainage of the basal cistern. Soft bone was removed from the tip, the sinus plate, the root of the zygoma and the depth of Trautman's triangle. The base of the petrous bone was normal. A liberal area of dura about the petrous bone was exposed and found negative.

The cavity of the sphenoid, its basilar process and the pontine cistern were drained as described.

The temperature and pulse variation during the first four postoperative days is graphically depicted in figure 8. Compare with case 1, figure 5. The fluid cleared of staphylococci under

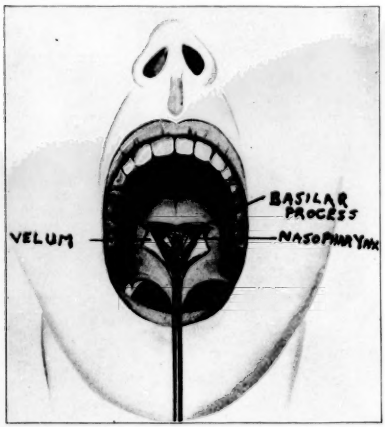

Fig. 7.—Opening of the velum and of the nasopharyngeal soft parts to expose the basilar process of the sphenoid.

direct treatment with bacteriophage, but streptococci remained in the sediment. The patient's subjective symptoms largely disappeared during these four days and there was marked improvement in the objective signs. The temperature and pulse rose rapidly on the fifth postoperative day and the child died suddenly in a convulsive attack.

The autopsy report is partly as follows: About the brain stem at the base there was a purulent exudate. The entire area of this was not more than 5 cm. in diameter. This area centered in the region of the lower pons and here there had been extensive exudate organization. There was marked obstruction to the circulation of spinal fluid in the region of the fourth ventricle and its foramen, which in turn produced an extensive obstructive internal hydrocephalus, all of the higher ventricles being tremendously distended by a slightly cloudy fluid. The anatomic diagnosis was acute meningitis, localized; acute obstructive internal hydrocephalus.

Microscopic examination of sections of the cord, pons and medulla showed marked inflammation. The extent of this tissue reaction was such as to point to the fact that this inflammation had been present for some time. There were areas which showed necrosis of abscess formation. There was some reaction in the superficial layers of the brain tissue characterized by a perivascular infiltrate extending along the lymph spaces of the blood vessels into the pons and medulla. The condition found indicated an attempt at localization of the infection. The degree of organization changes pointed to infection being present for some time.

The clinical picture in case 2 contrasts strongly with case 1. The stiffness of the neck and the presence of a positive Kernig's sign evidence involvement of the cisterna magna. The marked irritability, headache and hyperactive reflexes suggest vascular extension of the infection. The infection is no longer "walled off" at the site of invasion. The patient should have been operated on earlier.

The third patient was a poor surgical risk. The case serves to emphasize the necessity of early diagnosis and immediate drainage.

CASE 3.—G. M., a woman, aged 28, a nurse, entered the hospital Jan. 18, 1934, complaining of constant frontal and vertex headache and pain in the left side of the neck, the occipital region and the left ear canal; chronic sore throat; a nasopharyngeal purulent drainage; polyarthritis, and diabetes. She had had sinus disease for fourteen years. Numerous sinus operations failed to give relief. Tonsillectomy and appendectomy had been performed. She had had diabetes for several years.

Physical examination was negative, except for the upper respiratory tract. The nose and the nasopharynx contained thick mucopus. The right ethmoid labyrinth had been completely exenterated. There were some ethmoid cell remnants and small polypi on the left side. Both antral cavities were open into the nose (Caldwell-Luc). Both frontal ducts were widely open. The anterior walls and part of the floor of both sphenoidal cavities had been removed. There were deep pterygoid pneumatizations on both sides and several small cavities in the basilar process, which could be explored with a probe. A thick, pyogenic membrane covered the remnant of the sphenoidal cavity. There was a spontaneous nystagmus in every plane. The horizontal nystagmus was most marked and that in the vertical plane was mixed in type.

X-ray study of the base presented only a very dense picture and little useful information.

The temperature was 98, pulse 80, respiration 20. The spinal fluid was cloudy and contained 190 cells. The phenol test was ++. Nonne-Apelt tests were +++ and 2 +++, with no bacteria. Leukocytes numbered 7,500. The urine was acid, with a specific gravity of 1.027; there was a slight trace of sugar; tests for acetone and diacetic acid were negative.

The operative management was the same as described in case 2. The drill opened two cavities containing pus in the marrow of the basilar process. The effect on the temperature, pulse and respiration is shown in figure 9.

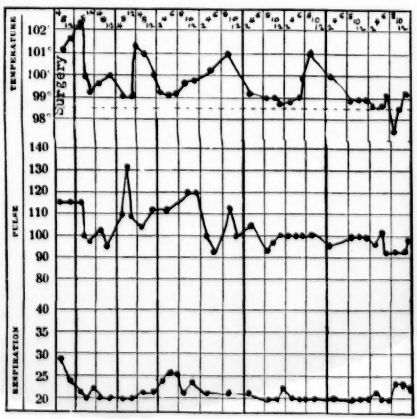

Fig. 8.—Temperature, pulse and respiration in case 2 during the first four days after operation.

The characteristic pain diminished during the first few postoperative days and the patient was definitely improved. Sugar, acetone and diacetic acid were present in the urine on the second postoperative day and continued in varying amounts for eleven days. The bowel condition was difficult to manage. These two facts suggested involvement of the pituitary gland and a definite diagnostic point for consideration.

The temperature varied from 1 to 1.5 degrees daily for seventeen days. There was slight variation in the leukocytes until the eighth day, at which time they increased to 13,350,

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with a polymorphonuclear count of 92 per cent. The count increased to 29,400 on the twelfth postoperative day. The spinal fluid remained practically the same as originally noted except that on two occasions isolated colonies of staphylococci were reported as probable contaminations.

The patient was about her room from the fifth to the tenth postoperative day. She constantly complained of increasing occipital headache, to which was later added bitemporal pain.

The clinical picture changed suddenly on the nineteenth postoperative day. There were several indications of cerebral extension. The patient became stuporous on the following day and died on the twenty-third postoperative day.

On postmortem examination the pia-arachnoid and dura were very adherent and thickened in the region about the pons and medulla. Adhesions were so dense in this area that the brain was dissected free by the knife only. The ventricles were not distended. The deeper brain structures showed no important pathologic changes. The endosteum was very much thickened over the base of the skull and there was an accumulation of pus over the bone above the orbital plate, particularly on the right side. The inflammation and tissue reaction emanated from the sphenoid bone. The surgical drainage area was demonstrated in the middle of the sphenoid, which lay adjacent to a point corresponding to the lower third of the pons. The sphenoid bone was explored. There were several cavities within this bone containing pus and showing bone necrosis. The density and the age of the inflammatory reaction in the tissues adjacent to the sphenoid bone implied that this inflammation had been present for a long period and that there was superimposed on the older process an acute pyogenic inflammation.

Microscopic examination of sections of bone from the sphenoid region showed an extensive old osteitis with areas of bone proliferation and areas of bone destruction. Sections of brain from the base showed an old meningeal productive inflammation of low grade, showing marked proliferation with fibroblasts and thickening of the arachnoid and pia accompanied by proliferation of blood vessels. Superimposed on this process there was an acute pyogenic meningitis with areas of necrosis and accumulation of abundant fat. The nervous tissue lying beneath the process described showed a mild glial proliferation and accumulation of inflammatory wandering cells about the blood vessels.

The diagnosis was chronic osteitis of the sphenoid bone; chronic leptomeningitis with superimposed acute pyogenic meningitis.

These three cases present distinct phases of the same process. The clinical picture in the first case resulted from early inflammation with congestion, without the demonstrable presence of organisms, involving the veins and the dura of the middle fossa and the anterior portion of the posterior cistern.

It is my impression that the "aching" and retrobulbar pain depend on venous congestion. The relief is too rapid for a subsiding inflammation. The same rapid disappearance of these symptoms is frequently noted after a complete mastoidectomy. The pain in the neck results from superficial inflammation of the brain stem. Confinement of the process to this limited area by adhesion of the pia arachnoid had occurred in the first case.

The disease process in the second case had already passed this protective barrier when the patient was hospitalized. The cisterna magna was already invaded and the infection was already following the vessels into the brain substance, as evidenced by the symptoms noted. The rapidity of this invasion depended on the virulence of the organisms and other obvious factors, but it is highly probable that there was a definite period during which characteristic signs and symptoms indicated confinement of the invasion to an area that may be drained. The early appearance of a suppurative otitis might divert attention from the true picture.

The chronicity of the disease in the third case, as indicated by the history and the microscopic examination, is positive proof of the ability of the pia-arachnoid to confine infection for varying periods of time to the area noted. There was obviously a time in the progress of this case when the bone and the pontine cistern could have been drained with probable success.

CONSIDERATIONS

1. An early diagnosis is obviously essential. One might draw a parallel with the diagnosis of appendicitis. The recognition of the early signs and symptoms and prompt intervention before the peritoneal barrier is passed has practically reversed the mortality rate.

2. Intratracheal anesthesia is advisable. It permits not only protection of the respiratory tract during operation but also immediate stimulation, if required.

3. It is my belief that this is the ideal method of draining infections extending from the petrous tip, as well as those originating in the sphenoid sinus. It is not only much simpler than the other approaches described but also provides dependent drainage.

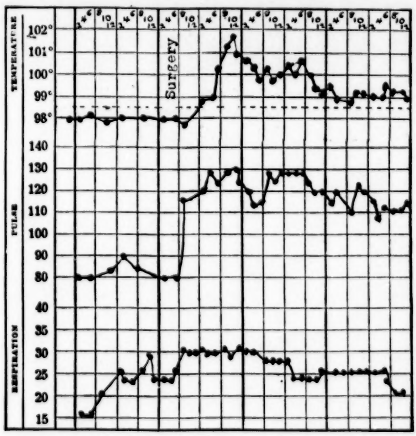

Fig. 9.—Temperature, pulse and respiration in case 3.

Eagleton [5] states that "infection of the petrous apex —from caries—enters directly into the pontine cisterna, in which area it is readily limited and to which it may be confined for a considerable time."

4. There is a considerable sudden loss of spinal fluid, despite the fact that the tube is in position for rapid introduction on removal of the instrument from the bone opening.

5. The dangers of this sudden loss of fluid are:

(*a*) A sudden disturbance in the equilibrium between the intracranial and the intermedullary capillary pressures, which may result in an ischemia of vital centers sufficient to cause death.

(*b*) Embarrassment of respiration of varying degree. Preparation for stimulation and artificial respiration should be at hand.

6. It is my belief that the fluid should be slowly withdrawn until the drainage is complete. This will relieve local congestion and aid in putting the area at rest. It will also permit greater collapse of the space and more complete "walling off."

5. Eagleton, W. P.: The Cerebrospinal Fluid, J. Laryng. & Otol. **44**: 660 (Oct.) 1929.

7. Treatment:
   A. Operative:
      1. The involved sinus mucosa and bone must be drained. This may be adequate for a cure in early cases. Such a result is frequently noted in cases of mastoiditis.
      2. The basal cistern must be drained when the indications are present.
   B. Postoperative:
      1. Direct intra-arachnoid medication is dangerous. It produces collapse and suspends respiration.
      2. I have used bacteriophage at body temperature with a striking result.
      3. Eagleton [5] states that irritating antiseptics paralyze respiration, solutions which are not isotonic cause a rise of temperature to 105 or over, that temperature below that of the body suspends respiration, and that free blood in the cistern produces all the clinical manifestations of meningitis. There is a slight amount of free blood immediately following incision of the dura but the fluid rapidly becomes free of it.

It is my hope that these considerations will awaken sufficient interest in accumulating an experience in this field to produce a standard management. This should result in saving many lives.

Blodgett Medical Building.

THE TREATMENT OF EARLY SYPHILIS WITH ELECTROPYREXIA

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Medical history is replete with stories of the resurrection of ancient formulas and therapies. From time to time the most modern researches have extracted the essence from gleanings of empirical therapeutic methods, superstitions and medieval nostrums. Such reanimated knowledge has often given a new impetus to the entire field of therapeutics. It is as if the dust of ages were shaken from the golden threads of a fine garment, and these threads then respun into a glittering vestment to serve present needs.

The empirical treatment of syphilis by means of heat harks back to the beginning of the sixteenth century, when this disease had been spread over much of Europe. During this period, this scourge was fought with various forms of heat. Sometimes thick blankets and hot baths were used alone; more often these were employed in conjunction with drugs, especially mercury. As late as 1872, very hot stove-heated rooms were used in Montpellier, France, in which patients suffering from syphilis were confined.[1] Very little, if any, other medication was employed and after a number of weeks the patient was discharged apparently cured, that is to say, relieved of his acute symptoms. In 1889 Kalashnikoff [2] wrote that following the experiments of Borowsky under the direction of Tarnowsky at St. Petersburg he treated many local manifestations of syphilis with heat. Whenever the lesions were found in the extremities, these were immersed twice daily in a bath at a temperature between 47.2 and 47.7 C. (117 and 117.9 F.) for thirty minutes. If the lesions were situated in the more inaccessible parts, such as the buttocks, the face or the genitalia, hot fomentations or hot water bottles with temperatures varying from 46.1 to 48.8 C. (115 to 119.8 F.) were applied twice daily for one hour. The syphilitic lesions treated in this manner disappeared more rapidly than when they were treated with the mercurials then in vogue. If mercury was combined with heat, even a more prompt dissolution of the lesion resulted. Kalashnikoff falsely attributed this action to an increase in circulation but correctly concluded that this local therapy was not a cure of the basic disease. However, he was well aware of the fact that heat in itself destroyed the syphilitic virus.

Lately, many new facts have been established which throw additional light on the effects of heat and fever in the treatment of syphilis. It is now well known that spirochetes found in primary and secondary lesions both of man and of animals are destroyed by heat. Boak, Carpenter and Warren [3] established the death point of spirochetes in vitro as 41 C. (105.8 F.) maintained for one hour. They also stated that even lower temperatures are lethal to this organism if maintained for longer time intervals. Carpenter and Boak [4] also stated that rabbit syphilis could be cured by febrile temperatures ranging between 41 and 42 C. (105.8 and 107.6 F) if several bouts of fever lasting approximately six hours were given. This work was preceded and followed by the investigations of Bessemans and his collaborators. The conclusions of these scientists are of such great importance that we will give a survey of their theories later on and couple them with our own experiences in treating primary and secondary syphilis with hyperpyrexia. Levaditi, de Rothschild,[5] Auclair, Haber, Vaisman and Schoen also admit that there is a direct curative effect of electrically produced fever on both the syphilomas of rabbits and systemic rabbit syphilis.

Bessemans and his collaborators [6] recognized the importance of local heat for overcoming the infectious potency of chancres and other external and internal syphilitic lesions long before the work of the aforementioned investigators had been begun. The first investigations of Bessemans were published in 1929. Later, Bessemans and Thiry [7] proved conclusively that spirochetes became immobile and disappeared from the lesions of human syphilis and that the lesions themselves healed after heat had been applied by means of the diathermic current. They also showed that the control lesions on the same patient which were not treated

From the Departments of Neuropsychiatry, Dermatology and Physical Medicine of Northwestern University Medical School and Wesley Memorial Hospital.

1. Richet, C.; Dublineau, J., and Joly, F.: Pyréto- et chimiothérapie associés dans la syphilis primaire et secondaire, Presse méd. **41**: 1649-1651 (Oct. 25) 1933.

2. Kalashnikoff, cited by Bessemans, A.: Pyrétothérapie et pyrétoprophylaxie antisiphilitiques sous l'action de moyens thermogènes physiques, Cong. franç. de méd. **4**: 187-283, 1934, and Mauriac, C.: Traitement de la syphilis, Paris, Masson & Cie, 1896, p. 342.

3. Boak, Ruth A.; Carpenter, C. M., and Warren, S. L.: Studies on the Physiological Effects of Fever Temperatures, J. Exper. Med. **56**: 741-750 (Nov.) 1932.

4. Carpenter, C. M., and Boak, Ruth A.: The Effect of Heat Produced by an Ultra-High Frequency Oscillator on Experimental Syphilis in Rabbits, Am. J. Syph. **14**: 346-365 (July) 1930.

5. Levaditi, C., and de Rothschild, H.: Etude expérimentale de la thermothérapie générale par les radiations à ondes courtes, Ann. Inst. Pasteur **52**: 23-67 (Jan.) 1934.

6. Bessemans, A.: The Local Application of Heat as an Adjunct in the Social and Individual Prophylaxis of Syphilis, Urol. & Cutan. Rev. **34**: 71-91 (Feb.) 1930. Bessemans, A.; de Potter, F., and Hacquaert, R.: Sur deux formes d'aéro-thermothérapie locale des syphilomes testiculaires primaries du lapin, Compt. rend. Soc. de biol. **100**: 757-760 (March 15) 1929. Bessemans, A.; Vercoutlle, J., and Hacquaert, R.: Nouvel essai de thermoprophylaxie sociale antisyphilitiques: Traitment aéro-thermique local du chancre primaire, Rev. belge sc. méd. **1**: 425-430 (May) 1929.

7. Bessemans, A., and Thiry, U.: Nouveaux essais d'application de la thermothérapie locale au traitement de la syphilis primaire et secondaire chez l'homme, Bruxelles-med. **13**: 299 (Jan. 15) 1933.

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either increased in size or remained stationary. The internal temperature of all these lesions, as recorded by means of a thermocouple inserted into them, varied roughly between 41 and 43 C. (105.8 and 109.4 F.). These temperatures were maintained between thirteen and eighty minutes by a constant application of the diathermic current. It was therefore established that local syphilitic lesions of man can be healed by heat and that the spirochetes disappear from lesions treated in this manner.

In the course of the earliest researches with hyperpyrexia, and shortly after we [8] had introduced and originated this therapy, one of us [9] treated two male patients with chancres. The results were reported in 1932 from data obtained in 1930. One patient made a prompt recovery, while secondary lesions developed in the other in spite of the fact that he had had ten fever treatments with rectal temperatures ranging between 39.7 and 40.8 C. (103.5 and 105.5 F.) for at least five hours during each treatment. At that time it was ascertained that the intra-urethral temperature of the male is at least 0.55 degree C. (1 degree F.) lower than the rectal temperature. The temperature of the mucosa of the glans, where the lesions were located, must therefore have been definitely below that supposed to be destructive to the spirochetes of the chancre.

Following these investigations, a third patient suffering from primary syphilis was treated with hyperpyrexia, and again prompt healing of the lesion was observed. Later secondary lesions developed but the rash was confined entirely to the face and scalp, the parts of the body that were uncovered during treatment. The local primary lesion again disappeared, but this did not prevent or materially influence generalized infection. Since syphilis is a systemic disease even in its primary stages, the local cooling of the skin of the face and scalp was believed to be the reason for this failure. In attempting to reconcile these first failures with the theoretical spirocheticidal temperature of 41 C. (105.8 F.) maintained for one or two hours, our conclusions were as follows: First, the temperature of various parts and organs of the human body varies and the surface of the glans of the penis is at least 1.1 degrees C. (2 degrees F.) lower than the rectal temperature. This relationship is maintained during fever produced by penetrating heat. Second, the temperature of the exposed surfaces of the skin, especially of the face and scalp, is too cool to be spirocheticidal at body temperatures; i. e., rectal temperatures ranging between 41 and 42 C. (105.8 and 107.6 F.), the upper limit of safe artificial fever treatment.

Three of our patients afflicted with primary and one patient with primary and secondary syphilis were therefore treated in an entirely different manner. The subject was placed in a hot air cabinet so constructed that he could be rolled in and out while in a horizontal recumbent position. The air temperature of this cabinet could be controlled with ease. A glass headpiece was fitted to the end of the cabinet in such a manner that the subject was bathed in hot air from toe to pate. Besides this, diathermic electrodes were adjusted to his back and chest. Thus it was possible to apply varying amounts of external and penetrating heat at will. Furthermore, skin temperatures were recorded by means of thermocouples placed inside small needles, which were inserted under the skin of the chest, face and scalp. Thus it was possible to maintain at will a definite measured temperature throughout the patient's body. Needless to say, this complicated procedure was attended with many technical difficulties, but we believed that the possible accomplishment of our goal, the cure of syphilis in its earliest stages, justified our efforts.

We do not recommend this technic to any one. It is highly experimental. Placed in such an environment that the external temperature of the air he breathes is approximately 54.4 C. (130 F.) with about 65 per cent humidity, every patient reacts with a violent delirium, after the skin temperature has been maintained above 41 C. (105.8 F.) for an hour or even less. Nevertheless, we were able, but only barely able, to maintain skin and rectal, that is to say the external and internal temperatures, at this level or slightly above it for two hours during each treatment. In other words, every part of the patient was actually heated above 41 C. (105.8 F.) during a two-hour interval.

With this technic one patient was given two treatments, one three treatments, and two were given four

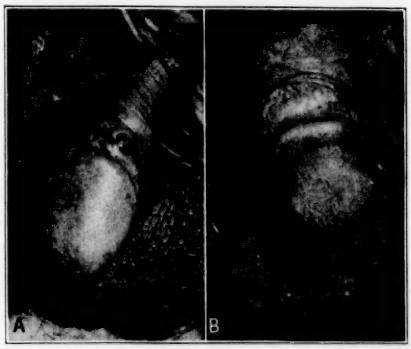

Fig. 1 (case 1).—Primary lesion (*A*) before treatment and (*B*) after three hyperpyrexia treatments totaling twenty-seven hours of temperature above 39.9 C. (103.5 F.) and for twelve hours above 41 C. (105.8 F.) of this total febrile period.

treatments. As before stated, the external and internal temperatures were kept well above 41 C. (105.8 F.) for at least two hours, supposedly the lethal temperature for spirochetes. These four patients were then closely observed in the hospital. One of them showed secondaries at the time of admission. These, as well as the chancre, disappeared after the second treatment, to recur a week after the fourth and final treatment. The other two patients developed syphilitic rashes six and seven weeks after their final treatments, and the fourth patient developed a syphilitic pharyngitis two months after cessation of treatment. In other words, the syphilitic infection progressed in spite of now theoretically adequate heat treatment.

The inflamed lymph glands of these four patients decreased markedly in size but did not disappear entirely. In one case these glands later enlarged a second time, and finally a generalized adenopathy resulted. An epitrochlear gland was removed and found to contain many spirochetes and pus. All chancres healed promptly and were always found to be superficially free from spirochetes twenty-four hours after treatment. No spirochetes were found in them at any

8. Neymann, C. A., and Osborne, S. L.: Artificial Fever Produced by High Frequency Currents: Preliminary Report, Illinois M. J. **56**: 199-203 (Sept.) 1929; The Treatment of Dementia Paralytica with Hyperpyrexia Produced by Diathermy, J. A. M. A. **98**: 7-13 (Jan. 3) 1931.

9. Neymann, C. A.: Hyperpyrexia Produced by Physical Agents, in Mock, H. E.; Pemberton, Ralph, and Coulter, J. S.: Principles and Practice of Physical Therapy, ed. 1, Hagerstown, Md., W. F. Prior Company, Inc., 1932, chapter 17.

time after the second treatment, even when sectioned, impregnated with silver and stained. The Wassermann and Kahn reactions, positive in three cases before treatment was started, became more positive but remained negative in the other patient. Judging from these four cases, as well as the three cited previously, it is therefore safe to conclude that hyperpyrexia, even when apparently applied in adequate doses and even when the external surface of the skin is heated to a spirocheticidal temperature, is not able to eradicate the syphilitic virus. However, we believe that it is also safe to conclude that hyperpyrexia per se influences and partially arrests the progress of the disease.

A lymph gland from each of these four patients treated with hyperpyrexia alone was removed. These glands were sectioned and stained. Fragmented or normal appearing spirochetes were found in three of the glands despite the fact that the sectioned site of the chancre removed at the same time showed no organisms. This seemed very paradoxical until the latest researches of Bessemans, Van Haelst and De Wilde [10] gave some insight into the true state of affairs. According to these investigators the spirochetes found in the

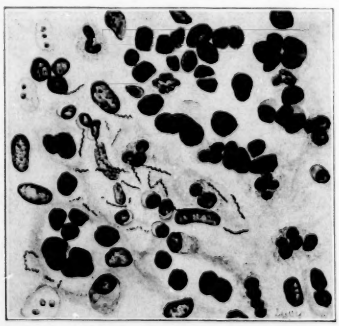

Fig. 2 (case 1).—Spirochetes in a histologic section of a chancre before treatment.

inguinal and popliteal lymph glands of syphilitic rabbits and guinea-pigs and in the spleen and brain of syphilitic mice are organisms adapted to more difficult conditions of existence. They are very virulent; one single organism is capable of causing an infection, and they are quite resistant to heat and chemotherapy. In all these attributes they differ from the spirochetes found in primary and other active lesions. These facts definitely ascertained in animal syphilis may well apply to human syphilis. At least we believe they explain the seven failures cited. A similar failure was cited by Boak, Carpenter, Goldstein and Warren.[11]

Epstein and Cohen [12] treated thirty-three cases of early syphilis with artificial fever ranging between 39 and 40.5 C. (102.2 and 104.9 F.) maintained for six or seven hours. They gave between two and four treatments in each case and observed that in thirty-one of these thirty-three cases the darkfield was rendered negative by means of hyperpyrexia alone and that the clinical lesions of early syphilis healed promptly in all cases in which the darkfield examination became negative. The serologic reactions were not reversed from positive to negative in any case, and three clinical recurrences were observed after cessation of treatment. While the temperatures employed by Epstein and Cohen were not high enough or sustained long enough to be definitely spirocheticidal when compared with facts ascertained by in vitro and in vivo experiments, their conclusions that hyperpyrexia alone is not a satisfactory treatment of early syphilis coincide with our own point of view.

Simpson [13] treated six patients with early syphilis more intensively with fifty hours of sustained fever between 40.5 and 41.1 C. (105 and 106 F.). Two of these patients relapsed after fever therapy, while the Kahn and Kolmer serologic reactions became less positive in three and more positive in one. Therefore, if we combine these experiences of Boak, Carpenter, Goldstein and Warren, of Epstein and Cohen, and finally of Simpson with our own seven cases, we must reiterate the conclusion that artificial fever will not eradicate the syphilitic virus or cure the disease at temperatures not fatal to the patient. The literature now consists of forty-seven cases treated by hyperpyrexia alone. This treatment has failed uniformly.

The next patient in the present series was treated with massive doses of arsphenamine and a bismuth compound immediately after the hyperpyrexia treatments were ended. The Wassermann and Kahn reactions, which had become positive, were reversed to negative one month later, and the patient has remained apparently free from all signs of syphilis during the past eighteen months. He has had no antisyphilitic treatment during this period.

A brief summary of the clinical history follows:

The patient was admitted to the hospital, March 5, 1934. Exposure had occurred six weeks before, and a lesion had been noticed in the sulcus of the penis twelve days before admission. On admission two lesions, 2 by 3.5 cm., one on the shaft and one in the sulcus of the penis, were seen. They were definitely circumscribed, elevated, flat topped with saucer shaped erosions, which were encrusted and had a serosanguineous discharge. There was an inflammatory areola around these lesions. The inguinal lymph glands were bilaterally enlarged, rubbery in feel, and painless on pressure. The darkfield was positive. Wassermann and Kahn reactions were negative. A biopsy of the chancre showed many spirochetes.

The patient was given the first hyperpyrexia treatment March 5. External (skin) and internal (rectal) temperatures were maintained at approximately 41 C. (105.8 F.) for two and a quarter hours. After the treatment, no spirochetes were seen in the darkfield.

March 8 the Wassermann reaction was +++ and the Kahn reaction +++. One atypical spirochete was seen in the darkfield, and a great number of round and ovoid bodies were observed with curious flagella or whiplike appendages. The primary lesions were decreased to half their size and the right inguinal lymph glands were smaller.

The second hyperpyrexia treatment was given with external and internal temperatures above 41 C. (105.8 F.) for two and a quarter hours and above 42 C. (107.6 F.) for one hour.

March 12 the Wassermann reaction was +++ and the Kahn reaction +++. Biopsy of the ring of the chancre, which was completely healed, showed no spirochetes. The chancre was epithelized and only a very small ring from the biopsy remained at its former site. The regional lymph glands have further decreased in size.

The third hyperpyrexia treatment was given with external and internal temperatures above 41 C. (105.8 F.) for two and three-quarter hours and above 42 C. (107.6 F.) for one and a half hours.

10. Bessemans, A.; Van Haelst, J., and De Wilde, H.: An Experimental Study of the Problem of the Existence of an Invisible Form of the Syphilitic Virus and of Spontaneous Spirochetosis in Rabbits, Am. J. Syph. & Neurol. **19**: 161-184 (April) 1935.

11. Boak, Ruth A.; Carpenter, C. M.; Goldstein, J., and Warren, S. L.: A Study of a Primary Case of Syphilis Subjected to Fever Therapy, Proc. Fourth Annual Fever Conference, New York, April 27, 1934, pp. 5-6.

12. Epstein, N. N., and Cohen, Maurice: The Effects of Hyperpyrexia Produced by Radiant Heart in Early Syphilis, J. A. M. A. **104**: 883-890 (March 16) 1935.

13. Simpson, W. M.: Artificial Fever Therapy of Syphilis, J. A. M. A. **105**: 2132-2140 (Dec. 28) 1935.

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March 15 the Wassermann reaction and the Kahn reaction were +++.

March 16 a gland the size of a cherry stone was removed from the left inguinal region. Spirochetes were found in microscopic stained sections of the gland. A transplant into a rabbit's testicle did not produce a syphiloma.

March 19 the inguinal lymph glands were no longer palpable. The site of the operative wounds healed. There were no secondaries.

March 22, the Wassermann reaction was +++ and the Kahn reaction ++++. Neoarsphenamine, 0.45 Gm., was administered.

March 24, bismuth salicylate, 1 grain (0.065 Gm.), was given.

March 28, neoarsphenamine, 0.9 Gm., was administered.

March 31, bismuth salicylate, 1 grain, was given.

April 2, neoarsphenamine, 0.9 Gm., was administered.

April 4, bismuth salicylate, 1 grain, was given.

cent positive before treatment was begun. Possibly this is due to the sudden death of great numbers of spirochetes, the endotoxins of which are massively liberated and suffused into the body liquids. A further fact of great interest is the presence of spirochetes in microscopic sections of a lymph gland of the patient while the sections of the chancre or original site of infection show no organisms. It is also interesting to note that in this case the lymph gland, which contained somewhat atypical appearing spirochetes, did not produce syphilomas when transplanted into rabbit testicles.

Buoyed up by this favorable result, we treated six further cases with combined heat and chemotherapy. The clinical results of these seven cases obtained with combined therapy are summarized in the accompanying

Clinical Results Obtained with Combined Therapy in Seven Cases

Case	Name	Date Admitted for Treatment	Type of Syphilis	Reaction Before Treatment	Type of Treatment	Number of Days of Treatment	Maximum Reaction During Treatment	Maximum Reaction After Treatment	Clinical Results
1	C. S.	March 5, 1934	Primary	Wassermann negative; Kahn negative	Three sessions of hyperpyrexia followed by 4 injections of arsphenamine and 4 injections of bismuth salicylate	46	Wassermann +++; Kahn ++++	Wassermann remains negative; Kahn remains negative	No clinical sign of syphilis for 18 mos. after treatment ceased
2	R. L.	Oct. 8, 1934	Primary	Wassermann negative; Kahn ++	Five sessions of hyperpyrexia with 0.3 Gm. of arsphenamine injected during last session, followed by five injections of neoarsphenamine and three injections of bismuth salicylate	68	Wassermann ++++; Kahn ++++	Wassermann remains negative; Kahn remains negative	No clinical signs of syphilis 14 months after treatment ceased
3	R. G.	Oct. 18, 1934	Primary and secondary	Wassermann ++++; Kahn ++++	Eight sessions of hyperpyrexia followed by six neoarsphenamine injections and three injections of bismuth salicylate	63	Wassermann ++++; Kahn ++++	Wassermann remains negative; Kahn remains negative	No clinical signs of syphilis during 14 months since reaction has become negative
4	J. P.	Dec. 8, 1934	Early primary	Wassermann negative; Kahn negative	Nine sessions of hyperpyrexia interspersed with four injections of neoarsphenamine	36	Wassermann negative; Kahn negative	Wassermann remains negative; Kahn remains negative	No clinical signs of syphilis during 13 months since reaction has become negative
5	J.McC.	July 11, 1935	Primary	Wassermann negative; Kahn negative	Three sessions of hyperpyrexia interspersed with and followed with five injections of neoarsphenamine	18	Wassermann ++++; Kahn ++++	Wassermann remains negative; Kahn remains negative	No clinical signs of syphilis for 7 months since treatment ceased
6	C. Z.	July 24, 1935	Primary and secondary	Wassermann ++++; Kahn ++++	Two sessions of hyperpyrexia with 0.3 and 0.45 Gm. of neoarsphenamine given at height of fever followed by 3 injections of bismuth salicylate	43	Wassermann ++++; Kahn ++++	Wassermann remains negative; Kahn remains negative	No clinical signs of syphilis for 6 months since treatment ceased
7	A. G.	Sept. 22, 1935	Primary and secondary	Wassermann ++++; Kahn ++++	Three sessions of hyperpyrexia with 0.3 and twice 0.6 Gm. of neoarsphenamine given during these sessions followed by two injections of bismuth salicylate	23	Wassermann ++++; Kahn ++++	Wassermann remains negative; Kahn remains negative	No clinical signs of syphilis for 5 months since treatment ceased

April 6, the Wassermann reaction was ++ and the Kahn reaction was ++.

April 11, neoarsphenamine, 0.9 Gm., was administered.

April 13, the Wassermann reaction was ++ and the Kahn reaction was ++.

April 18, bismuth salicylate, 1 grain, was given.

April 20, the Wassermann reaction was negative and the Kahn reaction was negative.

Following this the patient was given seven injections of neoarsphenamine and ten injections of bismuth salicylate up to Sept. 6, 1934. The serologic reactions have remained consistently negative and the patient has shown no further signs of syphilis in the eighteen months since all treatment ceased. He has married and a healthy child has been born. The serologic reactions of the wife and child are negative.

Summarizing this case, we believe that the disease was apparently aborted in forty-six days by the use of combined treatment. It is interesting to note the immediate flare up of the Wassermann and Kahn reactions after the first session of hyperpyrexia. We have noted an increase in the intensity of the serologic tests in almost every case in which such tests were not 100 per

table. A survey of this table shows that in every case all symptoms of the disease disappeared shortly after combined therapy was instituted. These seven patients have remained free from all clinical and serologic symptoms for periods ranging from five to eighteen months. The seventh patient showed the usual absence of clinical symptoms after treatment, but the Wassermann and Kahn reactions were still four plus, Oct. 8, 1935. At this time he left the city against medical advice and could not be contacted again until February 1936. In the interim his serologic tests became negative without further treatment, and no clinical signs of syphilis were present when he was reexamined in February. In 100 per cent of this small series the results have therefore been excellent during the observation period of from five to eighteen months.

What occurred during treatment and in what manner were these results obtained? Four of the seven cases were primary, with negative or practically negative serologic reactions at the time of hospitalization. J. P. (patient 4) had a very early primary lesion, seven days

old with a moderate enlargement of the regional lymph glands. In this case the Wassermann and Kahn reactions remained negative. Figure 1 shows the primary lesion before treatment and ten days later, after three hyperpyrexia treatments totaling twenty-seven hours of temperature above 39.9 C. (103.5 F.) and above 41 C. (105.8 F.) for twelve hours of the total febrile period. The action of heat alone on the clinical lesion

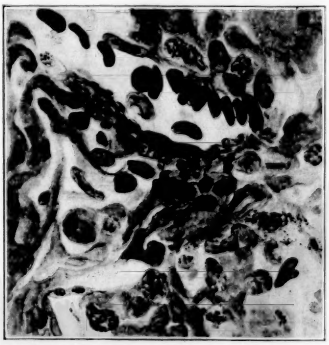

Fig. 3 (case 1).—Absence of all spirochetes in the histologic sections of the site of the chancre after two hyperpyrexia treatments. Temperature above 41 C. (105.8 F.) for four and one-half hours and above 42 C. (107.6 F.) for one hour.

is apparent and typical. At this time the regional lymph glands had decreased in size but could still be palpated as hard, discrete nodules. Judging from our experiences with the first seven cases treated with heat alone, they would have served as foci of infection for the spread of the disease had treatment been discontinued at this point. After the first hyperpyrexia session, repeated darkfield examinations of the serosanguineous fluid obtained from the base of the chancre showed no spirochetes. This is also a typical finding true of all cases treated with this amount of artificial fever.

In the other three primary cases, consisting of case 1, the clinical history of which has already been summarized, and cases 2 and 5, positive or more intensely positive serologic reactions developed after the first fever treatment. This was also true of six of the seven cases treated with fever alone. It is therefore safe to conclude that there is a rapid and intense mobilization of antibodies following fever therapy. We theorize that this is due to a massive destruction of the spirochetes but realize that other factors may play an important rôle in bringing about this increase of amboceptor formation. Only the youngest chancres with the least systemic involvement treated by us did not show this immediate change to a more positive serologic reaction.

A biopsy of the chancre in case 1 showed many spirochetes. Figure 2 is the reproduction of a drawing made from a microscopic section of this biopsy. The second biopsy of the site of this chancre after two hyperpyrexia treatments (fig. 3) shows an absence of all spirochetes, a regression of the inflammatory processes and a decrease of the small cell infiltration. A section of an inguinal lymph gland removed four days later after a third session of hyperpyrexia (fig. 4) shows fragmented and intact spirochetes. Such sections are typical of the lymph glands of patients treated with fevers above 41 C. (105.8 F.) for two or more hours

Figure 5 shows practically the same changes in a microscopic section of a lymph gland of one of the first seven cases treated with hyperpyrexia alone after three sessions of fever, in which the external and internal temperatures were kept above 41 C. (105.8 F.) for one hour and above 42 C. (107.6 F.) for an additional hour during each treatment. Figures 4 and 5 are both representative sections of syphilitic lymph glands after such intense fever treatment.

A biopsy was made of every chancre. All microscopic slides showed changes before and after treatment similar to those seen in figures 2 and 3. Spirochetes were never found in the stained, silver impregnated sections of chancres after two or three sessions of hyperpyrexia. Five lymph glands were removed after intensive fever treatment. All showed the presence of intact or fragmented spirochetes if fever alone was used as a therapeutic agent. We believe that all these microscopic sections clearly demonstrate the destruction of spirochetes by heat alone, particularly in the chancre. However, we must conclude that not all spirochetes, especially those found in the lymph glands, are destroyed by heat. This is even true in cases in which temperatures of 42 C. (107.6 F.) have been employed for several hours and to temperatures of 41 C. (105.8 F.) for ten or fifteen hours. The experiments that fix the in vitro death point of spirochetes at 41 C. (105.8 F.) maintained for two hours or 42 C. (107.6 F.) maintained for one hour, therefore, do not apply to spirochetes found in vivo in human beings. Furthermore, the experiments with rabbit syphilis, which seemed to demonstrate the possibility of eradicating the disease by means of temperatures similar in intensity to those applied by us, do not apply to human syphilis.

Patients 1 and 3 were treated with arsphenamine and bismuth salicylate after hyperpyrexia. In case 1 it took 3.15 Gm. of arsphenamine and 4 grains (0.26 Gm.) of bismuth salicylate to reverse the serologic reactions, which had become positive. Later, 5.4 Gm. of neo-

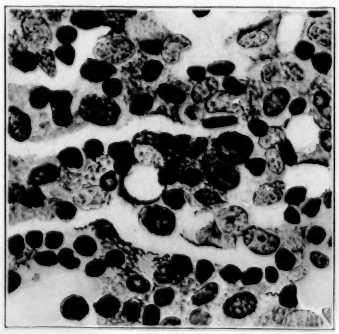

Fig. 4 (case 1).—Fragmented and degenerated spirochetes in a histologic section of an inguinal lymph gland after three sessions of hyperpyrexia at temperatures above 41 C. (105.8 F.) for more than two hours and above 42 C. (107.6 F.) for approximately one hour during each session.

arsphenamine and 10 grains (0.65 Gm.) of bismuth salicylate were given during the next four and a half months as a precautionary measure against a recurrence of the syphilitic infection, which we believed to be under control. It took forty-three days of combined treatment to reverse the serologic reactions after Wassermann and Kahn reactions had become negative. In

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case 3, with primary and secondary syphilis, six injections of neoarsphenamine totaling 3.15 Gm. and four injections of bismuth salicylate totaling 8 grains (0.52 Gm.) were necessary to produce a negative serologic reaction after eight sessions of hyperpyrexia. After this, 9 Gm. of neoarsphenamine and 38 grains (2.5 Gm.) of bismuth salicylate were injected during the following five months as a precautionary measure. Sixty-three days of treatment was necessary to achieve negative serologic reactions. The examination of the spinal fluid of both patients was negative as regards cell count, globulin, Wassermann and colloidal gold reactions at the end of the treatment period.

As our work continued we gradually intensified the treatment by giving neoarsphenamine during the three and four day interims between bouts of fever. This was done in cases 4 and 5. Case 4 has already been partially analyzed. After the first three sessions of fever, which resulted in the healing of the primary lesion, three doses of 0.3 Gm., one of 0.45 Gm. and three of 0.6 Gm. of neoarsphenamine were given in the intervals between and following seven intensive sessions of hyperpyrexia. Thirty-six days was consumed in treatment. Patient 5 was given three sessions of hyperpyrexia interspersed and followed by five neoarsphenamine injections totaling 2.885 Gm. The first case has remained clinically and serologically negative, while the second remains negative after the usual preliminary positive flare up of the serologic tests. Eighteen treatment days was necessary to achieve this result.

We had already experimented with the injection of neoarsphenamine during the height of fever in case 2. We now continued these attempts in cases 6 and 7 and have given up to 0.6 Gm. of neoarsphenamine at temperatures of 41 C. (105.8 F.). It is our belief that the time necessary to achieve a negative serologic reaction is further reduced by this method. Both cases are now clinically and serologically free from all signs of syphilis and have remained free for almost six months. The early and speedy eradication of the disease by this method, therefore, seems probable. Patient 6 had only one kidney when treatment was begun. A nephrectomy because of renal tuberculosis had been performed three years previously.

All cases were tested for renal and liver function before and after treatment. The laboratory tests disclosed no signs of liver or kidney involvement after this therapy. It is therefore our belief that neoarsphenamine may be given to robust patients between bouts of fever and at the height of the fever in doses up to 0.6 Gm. without damage to the liver or kidneys. Electrocardiograms taken before and after treatment showed no change. Fever produced by electromagnetic induction even when extremely high temperatures are employed is therefore a harmless therapy. It is, of course, assumed that this therapy is always under proper clinical control and supervision.

The average time consumed in this treatment was forty-two days. An average of five sessions of fever was given each patient and an average of five injections of neoarsphenamine was given during the treatment period. A small amount of bismuth salicylate was also used. We believe that this combined method of treatment can materially decrease the period of treatment of early syphilis. We believe that the hope of an eradication of the disease in its early stages is brought a step nearer. Furthermore, we have shown that heat alone destroys human spirochetes in vivo but that there is a difference in their resistance to pyretotherapy dependent on the location in which they vegetate.

SUMMARY

1. Fourteen cases of early syphilis were treated with hyperpyrexia. This therapy was combined with neoarsphenamine and bismuth salicylate in half of this number.

2. All of the seven cases treated with hyperpyrexia alone developed further clinical or serologic signs of syphilis after treatment ceased.

3. All of the seven cases treated with combined therapy became serologically negative and showed no clinical signs of syphilis for periods ranging between five and eighteen months.

4. The average length of the treatment period necessary to obtain a negative serologic reaction can be materially shortened by using this combined therapy. In this series it averaged forty-two days.

5. Neoarsphenamine may be given to robust patients in doses of 0.6 Gm. at temperatures of 41 C. (105.8 F.) if this temperature is produced by penetrating heat; i. e., electromagnetic induction.

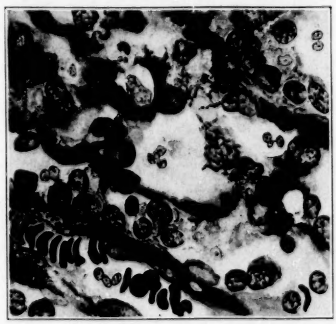

Fig. 5.—Fragmented and degenerated spirochetes after three sessions of hyperpyrexia. External (skin) temperatures and internal (rectal) temperatures were maintained above 41 C. (105.8 F.) for one hour and above 42 C. (107.6 F.) for an additional hour.

6. Spirochaeta pallida found in human syphilitic skin lesions is destroyed by temperatures of 41 C. (105.8 F.) maintained for two hours. The same organism found in human lymph glands is not destroyed by longer and higher temperatures ranging above 41 C. (105.8 F.) for five or more hours, and above 42 C. (107.6 F.) for one of these hours.

7. Such high temperatures alone, or when employed for treatment in conjunction with arsenicals and bismuth compounds, produce no demonstrable evidence of injury to heart, liver or kidney function, provided they are produced by penetrating heat; i. e., electromagnetic induction.

8. If external heat is used, especially if the temperature of the entire skin is raised to the same high level equal to that of the internal organs, terrifying states of delirium and dyspnea result.

9. It is probable that the syphilitic virus can be eradicated from all parts of the human body by the simultaneous use of high fever, arsphenamine and bismuth compounds.

10. This entire therapy presupposes an organized expert medical and nursing staff trained in giving hyperpyrexia treatments and the hospitalization of the patient during twenty-four hours for each session of hyperpyrexia.

104 South Michigan Avenue.

EPIPERICARDIAL FAT

ITS NONRECOGNITION A COMMON CAUSE OF ERROR IN X-RAY MEASUREMENT OF HEART SIZE

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A very important part in the cardiovascular examination of a patient is accurately to determine the size of the heart. In particular, and justifiably, much reliance is placed on x-ray measurement of heart size, provided certain sources of error are recognized and taken into account. The commonest cause of error has been that of distortion of the heart shadow by magnification when the x-ray tube is too close to the heart; this error has been much reduced and largely discounted by obtaining films with the tube from 6 to 7 feet (2 meters) behind the chest, with the front of the chest pressed against the film. This error is thus almost universally avoided, except that it is not yet everywhere appreciated that even the teleroentgenographic ("6 or 7 foot" film) heart shadow is considerably larger than the accurate heart shadow projection or orthodiagram; a statement should always be made as to which method is employed to obtain the heart measurements. A second common cause of error is to fail to take into account the shape and position of the heart when making measurements—two hearts of exactly the same size will vary considerably in area as well as in diameters if one is vertically placed in the thorax with the diaphragm low and the other horizontally placed with the diaphragm high. This cause of error is becoming better recognized although still far too frequent. A third common source of error and one far too little recognized, even on occasion by roentgenologists themselves, is the reason for the present note; namely, the presence of a triangle of epipericardial fat at the cardiac apex. Fortunately it is possible easily to avoid this error if one

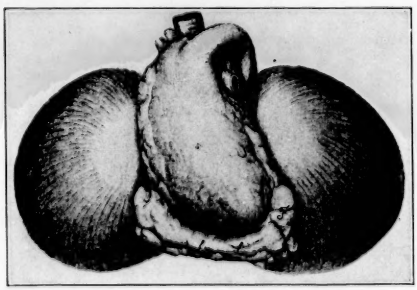

Fig. 1.—Illustration showing epipericardial fat, taken from the original paper of Schwarz.[1]

thinks of it, and furthermore the error does not enter into the measurement of heart size by the old and simple clinical method of palpating the maximal apex impulse, which lies well within the apex of the fat triangle.

Read before the New England Heart Association, Oct. 26, 1935.

1. Schwarz, G.: Ueber einen typischen Röntgenbefund am Herzen Fettleibiger und dessen anatomische Grundlage, Wien. klin. Wchnschr. **23**: 1850, 1910.

In many individuals a considerable amount of fat is attached to the outer side of the parietal pericardium and may therefore be called epipericardial fat (fig. 1). The accumulation of this fat is greatest at the pericardial attachment to both the right and left leaves of the diaphragm. At postmortem examination, we have seen this fat to be as much as 4 cm. in width lying lateral to the apex, 6 cm. in thickness, and extending upward on the pericardium for 7 to 8 cm., gradually diminishing in thickness. The proximity of this fat to the heart borders frequently obscures the true margins of the heart as seen by x-rays and may make it extremely difficult to measure the heart without including the surrounding fat.

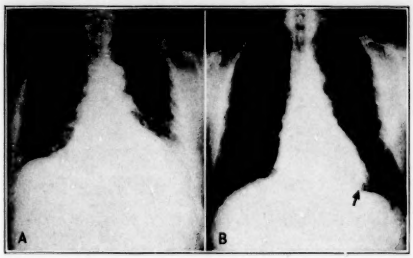

Fig. 2.—Teleroentgenograms ("seven foot" heart films) made from patient X: *A* shows obliteration of both cardiophrenic angles due to epicardial fat, during quiet respiration. *B* is a harder film taken during full inspiration a few minutes later to demonstrate the contrast in position and density between the shadows of the heart and of the epipericardial fat. The arrow indicates the true left cardiac border.

Schwarz[1] in 1910 called attention to the shadow caused by fat at the apex of the heart in x-ray films of the chest, and since that time a few others interested primarily in roentgenology have made similar observations.[2] Although its occurrence is familiar to many of those who interpret x-ray films, the importance of the recognition of this epipericardial fat by internists and practitioners in general has never been emphasized as it should be.

True enlargement of the x-ray heart shadow should cause considerable concern, as it invariably means either organic heart disease or at least temporary cardiac dilatation or pericardial effusion. Not infrequently when the heart shadow is measured the epipericardial fat is also included and this error sometimes results in the false impression that cardiac enlargement exists; the transverse measurement of the "heart" shadow may exceed half the internal diameter of the chest, increasing abnormally the so-called cardiothoracic ratio; and the area of the cardiac shadow may also be considerably increased. The importance of such an error in the case of a person with a normal heart can hardly be exaggerated.

The size of the patient does not determine whether or not epipericardial fat is present, but the largest accumulations do exist in obese individuals. When such persons are encountered and the roentgenogram shows the heart to be horizontal in position, extreme care must be exercised in locating the points on the heart border to be measured. Not only must the apex and the left cardiac border be carefully scrutinized but also the right border, as fat tabs are often found also at the angle of the right leaf of the diaphragm and the pericardium.

2. The latest special roentgenologic reference to the subject has been very recently published: Kautz, F. G., and Pinner, Max: Extrapericardial Fat Bodies, Am. J. Roentgenol. **35**: 40 (Jan.) 1936.

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When the pericardial diaphragmatic angle is not clearly outlined and especially if it is obtuse, one may be suspicious of the presence of epipericardial fat. Fluoroscopic examination, particularly when the Bucky diaphragm is used, will show two shadows, the denser one being the heart shadow and the lighter one the epipericardial fat shadow. The differences in density of these two shadows can be demonstrated on teleroentgenograms ("7 foot" chest films) when they are made to give maximum contrast with sufficient penetration. This is well brought out by taking two films of the same case, one that is "soft" and gives little or no contrast between heart and fat shadows and a second that is "hard" and penetrating, causing the fat shadow almost to disappear. The difference in shadows can be further emphasized by taking two films, one during ordinary quiet respiration and one in full inspiration as shown by the accompanying illustration. Figure 2 *A* is a routine teleroentgenogram ("7 foot" heart film) taken during quiet breathing; it gives the impression of cardiac enlargement until one looks at figure 2 *B*. The latter film of the same patient was made during full inspiration and with more penetrating rays to bring out the contrast in the position and the density of the heart shadow and of the triangular areas of fat at both cardiophrenic angles.

Fluoroscopic examination may give further assistance in distinguishing the triangular fat tab at the left cardiophrenic angle. It is sometimes possible to note the pulsation of the apex of the heart inside the left border of density and so within the fat shadow. Moreover, change in respiratory phase alters the position of the epipericardial fat in relation to the heart shadow. In deep inspiration the outer half of the diaphragm is displaced farther downward than is its mesial portion. The epipericardial fat is more lateral than is the cardiac apex, so that in full inspiration it may become more distinctly a separate lobule as it descends farther with the outer part of the diaphragm than does the cardiac apex with the more central portion of the diaphragm. This is easily made evident also in teleroentgenograms.

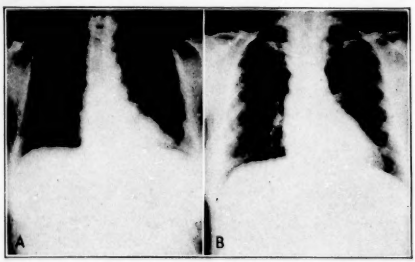

Fig. 3.—Teleroentgenogram ("seven foot" heart films) made from patient Y: *A*, taken during quiet breathing. Internal chest diameter 25 cm. and transerve "cardiac" diameter 14 cm. *B*, taken during inspiration a few minutes later, to illustrate the difference in relative position of the heart and fat shadows. Internal chest diameter 27.5 cm. and transverse cardiac diameter 12.5 cm. The edge of the fat shadow is 1.5 cm. beyond the cardiac apex.

When the shadows of the heart and of the epipericardial fat can be distinguished, the true outlines of the heart borders are easily located for accurate measurements of the size of the heart. In figure 3 *A* is a routine teleroentgenogram made with the tube at a distance of 7 feet from the heart and taken during quiet breathing. The heart is in a horizontal position and the left cardiophrenic angle is indistinct. The internal diameter of the chest is 25 cm. and the transverse diameter of the heart 14 cm., giving the abnormal cardiothoracic ratio of 14/25, indicative of enlargement of the heart. The cardiac area is 112 cm. as measured by a planimeter. Figure 3 *B* is a "7 foot" heart film of the same patient but made in full inspiration. It will be noted that the triangular area of fat at the left cardiophrenic angle can be much more easily distinguished. It has moved downward with the descent of the diaphragm and has consequently changed its position with relationship to the cardiac apex. The edge of the fat shadow extends 1.5 cm., beyond the true cardiac border, and if included in the measurement would still give an abnormal cardiothoracic ratio, indicating cardiac enlargement, especially in this phase of respiration.

SUMMARY

The presence of epipericardial fat at the cardiophrenic angles and especially on the left side just beyond the cardiac apex may be a source of error in measuring the heart shadow on roentgenograms ("7 foot" heart films) and may be misinterpreted as cardiac enlargement. The importance of such an error is obvious.

Massachusetts General Hospital.

GLOMUS TUMOR

REPORT OF A CASE

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AND
CARLO S. SCUDERI, M.D.
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Synonyms that have been used for glomus tumor are angioneuroma, angiosarcoma, Popoff [1] tumors, tumeur glomique, tumeur du glomus neuromyo-artériel, subcutaneous painful tubercle, angiomyo-neurome, subcutaneous glomae tumor, angioma, perithelioma, false neuroma, glomangiomas and neuromyo-arterial glomus.

The glomus unit is a short cut between the arterial and the venous elements. In reality, a more descriptive term is angioneuroma, since besides the vascular elements it consists also of sympathetic nerve fibers interwoven with the finer vessels. It was first described by Hoyer,[2] but its histologic structure was made clear by Sucquet.[3]

The diameter of the glomus varies from 60 to 220 microns, the smaller ones being found in the nail beds.

The function of the glomus was worked out by Lewis and Pickering [4] and by Grant and Bland,[5] who demonstrated its importance in temperature regulation. They showed that the glomus served for the maintenance of the temperature of exposed parts and the regulation of loss of heat.

Clinically it is characterized by a bluish discoloration of the skin, mounted on the top of a small cutaneous elevation. This area is very painful and, when irritated, produces a most excruciating radiation of pain up and down the extremity. More than 50 per cent of them,

From the Surgical Service, Cook County Hospital, and the Department of Surgery, University of Illinois College of Medicine.

1. Popoff, N. W.: The Digital Vascular System, Arch. Path. **18:** 295 (Sept.) 1934.
2. Hoyer, H.: Arch. f. mikr. Anat. **13:** 603, 1877.
3. Sucquet, J., cited by Popoff.[1]
4. Lewis, Thomas, and Pickering, G. W.: Heart **16:** 33 (Oct.) 1931.
5. Grant, R. T., and Bland, E. F.: Heart **15:** 385 (July) 1931.

according to Bailey,[6] are subungual, but almost every portion of the skin surface may be the seat of this lesion. The tumor is benign, and surgical removal produces a simple and complete cure.

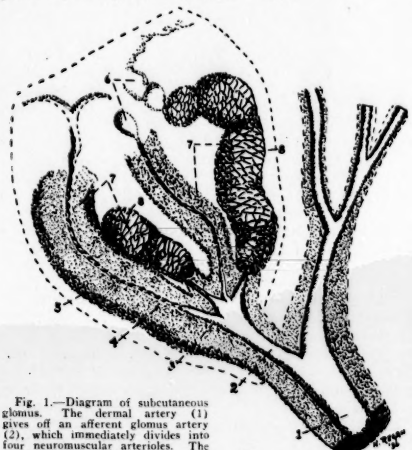

Fig. 1.—Diagram of subcutaneous glomus. The dermal artery (1) gives off an afferent glomus artery (2), which immediately divides into four neuromuscular arterioles. The elastica (3) of the afferent arterioles disappears as soon as the arterioles enter the glomus, at which point the lumen becomes narrower, while the walls become thicker, owing to an increase in smooth muscle fibers (4). The endothelial cells lining the vessels become apparently more numerous and ovoid, or even cuboid. Outside the layer of smooth muscle fibers lies a neuromuscular layer (5), containing peculiar smooth muscle cells poor in fibrils, and other cells without fibrils. Within this layer is found a network of unmyelinated nerve fibers with which, in Masson's opinion, many of the cellular processes from the neuromuscular layer are in direct continuity, thus indicating that certain of the neuromuscular cells are in reality ganglion cells. Afferent capillaries (6) leave the glomus vessels to enter the skin veins. The arteriole (7) with its rich perivascular network has a marked resemblance to the organ of Ruffini (8). (Copied from Mason and Weil, after Masson.)

Fig. 2.—The subcutaneous tumor on the medial side of the middle third of the arm. The pinhead sized bluish area in the center of the picture is the "trigger point" of the glomus area.

The first authentic case was pathologically described by Kolaczek[7] in 1878. At that time this type of tumor was not well understood and it was erroneously called an angiosarcoma.

6. Bailey, O. T.: Am. J. Path. **9**: 915 (Nov.) 1935.
7. Kolaczek, J.: Deutsche Ztschr. f. Chir. **9**: 1-48, 165-227, 1878.

To Masson[8] goes the credit for the very careful study of the histology and for the identification of its source. He described them as glomus tumors in 1924.

Mason and Weil[9] in 1934 wrote the first article in English on this type of tumor, giving an excellent bibliographic review, and collected all told, including their own, a total of thirty-four cases.

Lewis and Geschickter[10] in 1935 reported seventeen cases from the Johns Hopkins service since 1924.

Bailey[6] presented seven more cases and Stout[11] eleven new cases in 1935. Both authors reviewed the literature, giving a complete presentation of the subject.

Including the case that we are presenting, the total number of authentic cases in the literature is seventy.

Out of more than 74,000 surgical specimens from the Cook County Hospital, only one other case has been seen, and that in 1931, giving an approximate idea of the rarity of this lesion.

Fig. 3.—Low power field showing the great vascularity of the tumor. Both the arterial and the venous components of the tumor can be readily seen. Hematoxylin and eosin stain, × 160.

REPORT OF CASE

G. E., a man, aged 70, entered the Cook County Hospital, Feb. 12, 1936, for an incontrollable nosebleed of three hours' duration. While he was in the hospital he called the intern's attention to a very sensitive spot located on the inner side of the middle third of the arm. He stated that ten years before he had sustained a fall, striking the arm at this point, and that since then it had become very tender and later extremely painful to touch. Even the slightest pressure over the "trigger point"[12] caused terrific electrical pains to radiate down the arm.

The physical examination with the exception of a systolic blood pressure of 204 and a diastolic of 96 was otherwise essentially negative.

On the middle third of the arm on the inner surface there was an indistinct nodule, about the size of a split pea, under the skin. A little to the side of the center was a pinhead sized bluish area. This spot was the only "trigger point" of the tumor.

8. Masson, P.: Lyon chir. **21**: 257 (May-June) 1924.
9. Mason, M. L., and Weil, A.: Surg., Gynec. & Obst. **58**: 807 (May) 1934.
10. Lewis, Dean, and Geschickter, C. F.: Glomus Tumors, J. A. M. A. **105**: 775 (Sept. 7) 1935.
11. Stout, A. P.: Am. J. Cancer **24**: 255 (June) 1935.
12. "Trigger point" designates the one spot on the tumor which, when stimulated, sets off the nervous irritation, as the pressing of the trigger of a firearm sets off the explosion of the cartridge.

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February 21 the tumor was removed under procaine hydrochloride anesthesia. The tumor was found firmly adherent to the skin at its bluish tip. It was well encapsulated in connective tissue, which bled profusely from a generalized tissue oozing.

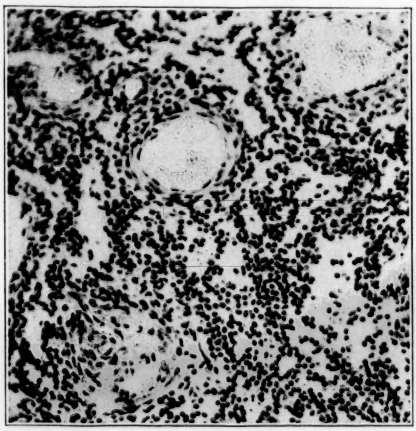

Fig. 4.—A higher magnification field showing the arterioles and venioles. The endothelium is surrounded by glomus cells. Hematoxylin and eosin stain, × 260.

When removed, it appeared as a dark bluish nipple about the size of a split pea. Microscopic examination was done by Dr. Benjamin Neiman of the department of pathology of Cook County Hospital.

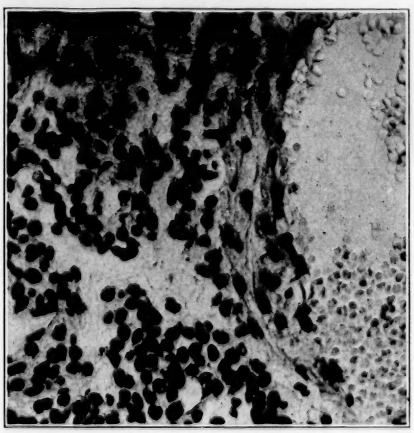

Fig. 5.—Between the vascular spaces are found round and oval cells, the cytoplasm of which has an affinity for eosin. The nuclei have a fine chromic network. The nuclei are uniformly round and pale staining. Hematoxylin and eosin stain, × 500.

The nodule was well encapsulated by hyalinized connective tissue membrane, in which could be seen focal accumulation of round cells. The nodule itself was composed of smaller and larger vascular spaces filled with red blood cells and lined by endothelial cells. Between these vascular spaces there were cords and trabecules composed of round to oval cells with a pale staining cytoplasm which had an affinity for the eosin stain. The nuclei were round and pale staining with a fine chromic network; at the same time these cells were slightly elongated in the forms of epithelial cells. Thick walled arteries and arterioles were prominent.

CONCLUSIONS

The diagnosis can be very easily made if one but keeps this possibility in mind.

A patient with this condition, who lives in the constant dread of having anything touch this painful area, can be rapidly and permanently cured.

3202 West Cermak Road—104 South Michigan Avenue.

Clinical Notes, Suggestions and New Instruments

CALCIFICATION IN THE SPLEEN

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Calcification in the spleen usually occurs in small zones, not infrequently in the capsule, occasionally in small infarcts, and at times in tuberculous or gummatous masses. It may occur in thrombosis of the splenic vein or in an echinococcus cyst. It is found only in "pathologic products" of the spleen; diseases associated with extensive general calcification (gout, calcinosis universalis) spare the spleen. No reference can be found in the literature to such an extensive deposition of calcium salts as was found in the following case:

History.—Mrs. M. H. M., aged 44, a housewife, complained of an uncomfortable sensation in the abdomen developing gradually during the last two years. This was described as a feeling of pressure, most marked in the left hypochondrium. During the last six months it had been aggravated by eating, by stooping forward, or by lifting the left arm. About once in each two or three weeks she had an acute gastric upset with vomiting and an associated feeling of pressure in the region of the heart.

She attributed this distress to an injury in an automobile accident three years previously. The coupé in which she was riding as a passenger turned over one or more times, stopping in the erect position. She could not describe what happened during this roll, but at the finish she was doubled over with her head on the floor and her feet toward the hood. Her greatest pain immediately following the accident was in the left side, under the lower ribs, where subcutaneous discoloration was evident for three or four weeks. Breathing was painful. She did not consult a physician at that time.

In her past history she stated that she had had an operation for appendicitis at the age of 5 years, typhoid at 21, a tonsillectomy at 30, and pneumonia at 36. She had had three full term pregnancies, each with normal delivery.

Physical examination was of no interest except for a palpable mass in the left hypochondrium, apparently the spleen, which descended about 4 cm. below the costal margin. By the fluoroscopic screen a large opaque shadow was found in the splenic area; it moved freely with the diaphragm. The density of the shadow was that of bone, arranged in branching trabeculae. Figure 1 shows the position and density of the shadow on a roentgenogram taken following ureteral catheterization and injection of an opaque medium through the left catheter.

Splenectomy was done in July 1934; immediate and subsequent postoperative results were satisfactory. The patient now states that she is in good health; she has lost the sensation of fulness with epigastric pressure. There has been no vomiting. She does not think that there is any increased liability to infection since the spleen has been removed; in fact, she believes

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that she is not as susceptible as before because she has not had a cold or other illness since that time. The peripheral blood picture is normal.

Gross Examination.—The spleen weighed 450 Gm. and measured 12 by 10 by 10 cm. Bulging into the hilus and converting most of its contour from the normal concave to a convex shape was a yellowish, stonelike mass covered only by scattered fibrous strands. Elsewhere the splenic capsule was intact, although over a portion of the lower pole irregularly shaped

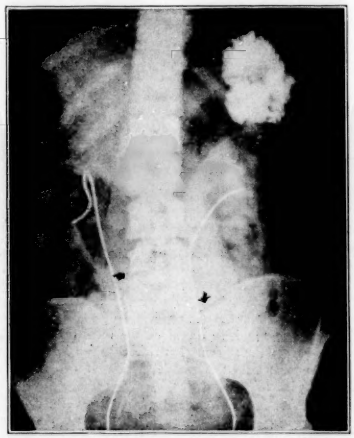

Fig. 1.—Density, position and size of the calcified mass in the splenic area after ureteral catheterization and injection of opaque medium through left catheter.

whitish yellow plaques occurred. The main splenic artery and vein were not present, but a branch of the former and a tributary of the latter lay in the persisting segment of the hilus near the upper pole. In order to examine the lesion it was necessary to resort to sawing. The mass so revealed proved to be quite discrete, 7.5 cm. in diameter and in addition to projecting into the hilus had cupped out a bed in the splenic substance, leaving a triangular fragment of apparently normal tissue at the upper pole and only the capsule elsewhere (fig. 2). At the center of the mass was an irregularly outlined whitish hyaline core. Completely surrounding and filling in all the indentations of this zone was a peripheral layer of yellowish calcified material, which, however, gave way to a translucent cartilaginous-like substance at the lower pole. In the latter region were scattered brownish specks, occasional blood vessels, small segments of splenic parenchyma adjacent to the capsule and one spicule of calcium.

Microscopic Examination.—Sections cut to include the central whitish and adjacent calcified foci showed scattered bits of splenic cells and sinusoidal walls, a fair number of erythrocytes and numerous collapsed or open but always empty arterioles. In the main, however, the parenchyma had been reduced to a hyaline state with nothing more than a faint shadow of the original pattern remaining. Calcium deposition without bony metaplasia had converted parts of the hyaline into a dense and formless matter interrupted by nothing more than clear vacuoles. The translucent lower pole exhibited the same basic change, although hyaline degeneration was less pronounced and not infrequently reticulum cells, patent blood-filled sinusoids and remnants of splenic follicles could be made out. The latter were sometimes the seat of hyperemia and of fresh hemorrhages. The follicular arterioles, although patent and devoid of subintimal hyaline thickening, were for the most part empty. From this prevailing picture there were variations in the direction of complete hyalinization on the one hand to almost nothing on the other. Deposition of iron-containing pigment was not seen. The only deviations from normal in sections cut from the upper pole were subintimal hyaline degeneration of the arterioles and the occurrence of a few eosinophilic polymorphonuclears. The former is so frequent in the splenic arterioles of healthy persons of middle age and beyond that no importance was attached to its presence here. The branch of the splenic artery supplying the upper pole was normal.

The pathologic diagnosis was massive hyaline degeneration and calcification of the spleen, apparently resulting from traumatic injury.

COMMENT

The clear cut history of an accident producing a contusion and accompanied by pain over the spleen area forces one to think seriously of traumatic injury as the cause of the splenic lesion herein described, but the mechanism of its production is a matter of speculation. The pathologic nature of the lesion is such that only a few causes are possible; namely, traumatic rupture of the spleen or its vessels, infarction, infection, or parasitic infestation.

In our experience trauma commonly leads to rupture at one or more points over either the convex or the hilar aspects of the spleen, or both. Usually such tears are transversely directed in relation to the long axis of the organ, often stellate, and affect both the capsule and the parenchyma. Some degree of hemoperitoneum is constant. While we have never encountered an example of such a rupture excepting in the fresh state, it is reasonable to assume that in the event of recovery without splenectomy the organ would be surrounded by a partially or

Fig. 2.—View of the spleen after sagittal sectioning. The calcarohyaline mass protrudes into the hilus and over much of its extent has a covering of little more than splenic capsule. The brownish spots in the glassy lower pole are bits of persistent parenchyma. Capping the lesion is a little normal spleen.

wholly organized hematoma and bound to surrounding structures by fibrous bands. Blood pigment deposition, liquefaction or calcification of any unorganized blood would complete the picture. Obviously such a rupture did not take place in our subject, for the spleen was free.

Although we have never seen such a thing in a large postmortem service, which includes many traumatic deaths, one

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must admit the possibility of rupture of the splenic pulp without tearing the capsule and without hemorrhage external to the organ itself. In the event of such an injury a rapidly formed and large hematoma might quickly destroy a portion of the parenchyma and later organize or calcify. Under such circumstances the tissue about the hemorrhage might reasonably be expected to suffer from malnutrition, slowly die and finally become more or less hyalinized, as was the case in our subject. Although admittedly not susceptible to proof, this concept is the best explanation that we can offer for the necrobiotic process present in the spleen.

Infarction, while mentioned, is out of the question, for large anemic infarcts of the spleen invariably involve the capsule as well as the parenchyma; total cellular necrosis follows, the dead and entirely avascular area shrinks, a well defined blood pigmented fibrous zone appears between the living and the necrotic segments, and fibrous adhesions form over the surface. All these features are lacking in the case at hand.

With respect to infection, we are unaware of anything other than tuberculosis that could give a picture of this kind, and there is no histologic evidence of its existence. While echinococcus cysts may eventually die and calcify, the outline of the chitinous membrane is always left behind to serve as a means of identification, and this too is lacking in our case.

Medical Arts Building.

PYELOGRAPHY OF THE SURGICALLY EXPOSED KIDNEY

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As a result of the accuracy of modern methods of renal diagnosis, exploratory operations on the kidney are rarely performed at the present time. However, in rare instances it may be impossible before operation to obtain all the diagnostic evidence that is desired, so that at the operation additional information will be of great value in deciding for or against nephrectomy.

In a recent case a preoperative diagnosis of right renal tuberculosis was made without the benefit of ureteral catheterization or intravenous urography. It was impossible to catheterize the right ureter because of a stricture at the lower end, although two attempts were made. After failure to catheterize the ureter, two sets of intravenous pyelograms were made five days apart. They failed to visualize the right side, whereas the left side gave normal results.

At the operation the exposed kidney appeared normal. There was questionable thickening of the ureter, and the question immediately arose as to whether or not the kidney should be removed.

It was decided to obtain a pyelogram of the surgically exposed kidney before proceeding with the nephrectomy. Ten cubic centimeters of diodrast was injected into the unopened pelvis and a roentgenogram was made. This showed some dilatation of the three major calices with a clubbing of the upper and lower calices, the minor calices being very indistinct. The minor calices, from the middle major calix, were destroyed and the medium filled a pocket which was irregular in outline in this region. The changes in this pyelogram resemble those of a tuberculous lesion. The tentative diagnosis of renal tuberculosis was verified and all doubt about the propriety of nephrectomy was removed.

Roentgen examination by fluoroscopy or film during or at the end of operation for kidney stones is routine procedure in all urologic clinics.

Although the necessity for making a pyelogram on the surgically exposed kidney does not arise very often, in rare instances, as in our case in which it confirmed the preoperative diagnosis of renal tuberculosis in spite of the fact that the kidney showed no external signs of tuberculosis, it may yield information that will aid the surgeon in deciding for or against nephrectomy.

From the Presbyterian Hospital of Chicago.

REPORT OF CASE

M. E., a man, aged 25, a medical student, admitted to the Presbyterian Hospital, Feb. 19, 1936, complained of pain in the right upper quadrant of the abdomen and an infection of the upper respiratory tract.

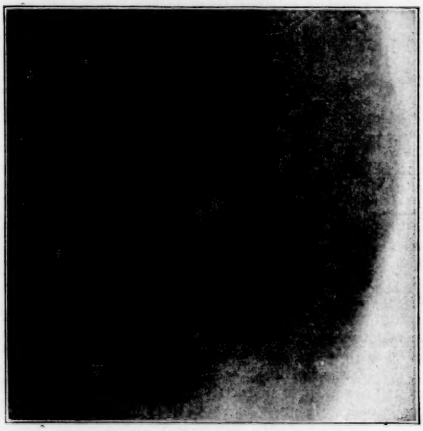
The family history and previous illnesses were irrelevant. There was no history of venereal disease.

The patient had had a head cold for the past week, which had kept him in bed, but he had no fever. Three days before, he was suddenly seized with a dull aching pain in the right side of the abdomen both anteriorly and posteriorly. Twenty-four hours before admission to the hospital he had a dull ache in the scrotum; the pain was severe and he was obliged to take medicine to control the pain.

Physical examination was negative except for possible swelling in the upper right quadrant. Rectal examination gave negative results.

Examination of the urine revealed no albumin and no sugar. There were 67 leukocytes and 122 red blood cells per cubic centimeter. Many tubercle bacilli were present in the sediment.

Blood count revealed 4,720,000 red blood cells, 9,400 white blood cells, and 90 per cent hemoglobin.



Drawing of pyelogram made on the surgically exposed kidney.

Roentgen examination showed evidence of healed tuberculosis of the lung. The genito-urinary tract was negative for stone.

Cystoscopic examination was negative. The catheter on the right side met an obstruction one inch above the bladder, beyond which it was impossible to advance it; no specimen of urine was obtained. The catheter on the left side passed all the way into the kidney pelvis; urine from the left side was sterile and free of pus; no tubercle bacilli were found. A second attempt to catheterize the right ureter met again the aforementioned obstruction.

Two sets of intravenous pyelograms were made on February 22 and February 26. The first set revealed a normal condition on the left side; there was no visualization on the right side. The second set showed again a normal condition on the left side and no evidence of filling on the right side.

A diagnosis of tuberculosis of the right kidney with a stricture at the vesical end of the ureter was made and operation was advised.

The patient was operated on, under ethylene anesthesia, February 28. Because of the normal appearance of the surgically exposed kidney, the question was raised by the patient's physician as to the justification for nephrectomy—as previously mentioned in this paper. An intravenous pyelogram was made and a nephrectomy was done. The diagnosis of renal tuberculosis was verified.

122 South Michigan Avenue.

Special Clinical Article

RECENT ADVANCES IN THE STUDY OF VIRUSES AND VIRAL DISEASES

CLINICAL LECTURE AT KANSAS CITY SESSION

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NEW YORK

The word virus means poison, and before the relation of bacteria, fungi, spirochetes and protozoa to disease was recognized it was customary to use it in a noncommittal manner to designate the causative agents responsible for certain maladies. As the etiologic agent of one disease after another was discovered, the word virus was still used at times to indicate a known infectious agent; for instance, the expression virus of syphilis is equivalent to Spirochaeta pallida. In addition to this new usage, the word was still employed to designate unknown or undiscovered etiologic agents. In view of Koch's postulates, infectious agents that had not been seen and cultivated on lifeless laboratory mediums were considered to be undiscovered or unknown, in spite of the fact that investigators were able to experiment with some of them, e. g., the viruses of cowpox and smallpox, and to use them for prophylactic purposes. Thus at one time most workers considered and a few still look on the viral diseases as a heterogeneous group in which all maladies of unknown etiology are placed. To the initiate, however, the term virus is as specific in its designation as is the word bacterium, and the expression Virus variolae or virus of smallpox is as definitive as is the expression Bacillus typhosus or bacillus of typhoid. Thus, infectious diseases are now divided into groups caused by bacteria, spirochetes, fungi, protozoa, Rickettsia and viruses, respectively; in addition there are those of unknown etiology.

The diseases of man that are known to be caused by or that are strongly suspected of being caused by viruses are measles, German measles, mumps, fever blisters, herpes zoster, varicella, smallpox, vaccinia, rabies, psittacosis, common colds, influenza, the St. Louis type of encephalitis, Japanese type B encephalitis, epidemic encephalitis or Economo's disease, lymphocytic choriomeningitis, poliomyelitis, lymphogranuloma inguinale, foot-and-mouth disease, Australian X disease, louping ill, Rift Valley fever, yellow fever, pappataci fever, dengue fever, warts, and molluscum contagiosum. In addition to man, lower animals, insects, plants and even bacteria are subject to viral maladies. In fact, no form of life seems to be exempt from such diseases, and, as one examines the list, it becomes obvious that a large number of devastating infections fall into the group. Naturally, physicians are interested in these conditions, but a broader interest in them has developed because of the discussion of the nature of viruses which leads one into a consideration, often philosophical, of the nature of living material versus that of inanimate substances.

NATURE OF VIRUSES

It would be futile at this time to attempt a discussion of all the interesting activities in the field of viruses. Consequently, it seems best only to excite curiosity with regard to the nature[1] of these active agents and then to consider briefly some of the most important recent discoveries in the field that have a direct bearing on the practice of medicine.

With the discovery that minute animals and plants in the form of protozoa, spirochetes, fungi and bacteria, instead of miasmas and the wrath of the gods, are responsible for certain infectious diseases, it became customary to assume that all infectious maladies arise through the action of such agents or their toxins. Even after it was demonstrated that many disease-producing agents are smaller than ordinary bacteria, most investigators still thought that such agents possess the characteristics of bacteria, differing from them only in respect to size. Indeed, for a long time a large part of the activities of investigators was directed toward the cultivation of them on lifeless mediums similar to those used for ordinary bacteria. However, from the time that it was shown that certain infectious agents pass through filters that hold back ordinary bacteria, a few independent thinkers have suggested that these small agents differ from the larger and better known ones, and an occasional worker has been bold enough to state that some viruses are not living organisms but inanimate substances capable of producing disease in one host after another not through autonomous multiplication but through their repeated fabrication in properly stimulated or injured host cells.

Such was the state of affairs until in 1915 and 1917, respectively, Twort and d'Herelle discovered the bacteriophage, whereupon investigators became fairly equally divided into two camps, one set believing the bacteriophage to be a minute living autonomous organism, the other looking on it as an inanimate substance formed by perverted bacteria capable of producing a similar perversion in other susceptible bacteria with which it comes in contact. Although the bacteriophage is not so important epidemiologically and therapeutically as it once was thought to be, its discovery stimulated interest in other viruses, which has resulted in the accumulation of many valuable facts.

Filters of porcelain or diatomaceous earth are useful for the separation of bacteria from viruses, but, through the use of them, little or no definite knowledge of the size of viruses can be obtained. Elford appreciated this fact and recently devised a method[2] of preparing collodion membranes with graded pore sizes of sufficient uniformity to be of value in the estimation of the magnitude of viruses. By means of them it has been shown that not all viruses are of the same magnitude, that the size of the infectious units of each virus is remarkably constant, that some viruses, e. g., that of vaccinia, are relatively large, possessing diameters of from 125 to 175 millimicrons, and, finally, that other viruses, e. g., those of foot-and-mouth disease and poliomyelitis, are very small and with diameters of from 8 to 15 millimicrons approximate the size of certain protein molecules.

The facts that no known virus has been cultivated in the absence of living susceptible cells and that some possess the order of magnitude exhibited by large molecules of protein have induced certain workers to view the host cells as the source of the viruses. The most suggestive work along this line is that of Stanley, who

Read in the General Scientific Meetings at the Eighty-Seventh Annual Session of the American Medical Association, Kansas City, Mo., May 12, 1936.

1. Rivers, T. M.: Physiol. Rev. **12**: 423 (July) 1932; Am. J. M. Sc. **190**: 435 (Oct.) 1935. Dale, H. H.: Viruses and Heterogenesis: An Old Problem in a New Form, Huxley Memorial Lecture, London, Macmillan & Company, 1935.
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recently reported [3] that he is able regularly to obtain large amounts of crystalline protein from plants infected with tobacco mosaic virus and that this protein has the property of exciting mosaic disease in inoculated plants. He is inclined to believe that the virus with which he is working is not a living organism but an autocatalytic substance arising from the proteins of the plant as the result of infection.

Stanley's experiments are important and his interpretation of the results may be correct, but less obvious explanations should be considered also. For instance, his crystalline protein may not be the virus but a new pathologic protein, serologically specific for the infection, resulting from the activity of the virus on the host, while the apparent infectiousness of his protein may be accounted for on the basis of its being accompanied regularly by the virus, which, in view of its minute size, might well constitute such a small part of the material that its detection by chemical and serologic technics would be difficult or impossible. Indeed, Hughes [4] has already brought evidence to show that pathologic proteins may arise from a host as the result of an infection and that such proteins may be antigenic in the host giving rise to them.

On the other hand, some viruses seem to be sufficiently large to represent minute living organisms. In infectious material from vaccinia, smallpox, fowl pox, psittacosis, canary pox and infectious ectromelia, numerous oval or round structures, spoken of as elementary bodies, are seen by means of ultraviolet photography or proper mordants and stains. Considerable amounts of the elementary bodies of vaccinia [5] have been obtained in a state of relative purity, and a chemical analysis [6] of them has shown that they are composed of water, protein, fat, carbohydrate and ash in quantities compatible with the idea that they are small organisms, provided each elementary body represents only a single infectious unit of the virus.

Sufficient has been said to indicate that no unanimity of opinion exists regarding the nature of viruses. At present three sets of ideas seem to cover the possibilities: (*a*) The extremely small viruses may be inanimate incitants of disease; (*b*) the medium sized viruses may represent primitive forms of life unfamiliar to us; (*c*) the large viruses may be micromicrobes or the midgets in the microbial world. To predicate that all viruses are identical in nature would at least be bold if not foolish.

THE ACTION OF VIRUSES

In order to study the effects of the activities of viruses and to control the diseases caused by them it is not essential to know their exact nature. If that were true, we would still be without vaccination against smallpox and rabies.

Although no virus has been cultivated on ordinary laboratory mediums, many of them have been induced to multiply in vitro in the presence of living susceptible cells; that is, in tissue cultures modified to suit the occasion. Cultures of viruses made in this manner are easy to handle and have yielded valuable information and products suitable for prophylaxis. For instance, it has been demonstrated that once a virus has entered a cell no amount of antiserum brought in contact with the cell can injure the virus or hinder its activity.[7] Such a phenomenon throws light on the clinical observations that the administration of convalescent or immune serum to an individual in whom the signs and symptoms of a virus disease are already manifest is without value.

It also appears that calf vaccine lymph, the oldest and best instrument of vaccination, can be improved on by vaccine virus cultivated in flasks in the presence of bits of viable chick embryo tissue suspended in Tyrode's solution.[8] This cultured vaccine virus is free from ordinary bacteria and can be administered intradermally to human beings, in whom it produces an immunity to standard calf lymph virus without the formation of disfiguring scars and without marked systemic reactions.

In spite of the fact that the exact nature of the virus of yellow fever is still unknown, Reed and his co-workers [9] many years ago showed that the virus is in the blood of patients and that it is carried from one person to another by mosquitoes. Within recent years, considerable additional information regarding the malady has been obtained. Stokes, Bauer and Hudson [10] transmitted it to monkeys. Then Theiler [11] demonstrated that white mice are susceptible and that the repeated passage of the virus through this host alters its pathogenicity for the monkey and man. With this altered virus mixed with immune serum Sawyer and his co-workers [12] have developed a safe and effective vaccine for the prevention of yellow fever in man. Furthermore, recent reports state that yellow fever virus grown in vitro in the presence of certain viable tissues becomes altered in such a manner that it is possible to use it for prophylaxis [13] in human beings.

When it was found that mice are susceptible to yellow fever, a neutralization test was devised by Sawyer and his co-workers [14] by which it is possible to ascertain whether a person has had the disease. By means of the test it has been demonstrated that yellow fever is or has been endemic in parts of the world that previously had been considered free from the malady.[15] Furthermore, Soper [16] has definitely found that in South America yellow fever is not always an urban malady but may occur in jungles remote from urban centers in the absence of the accepted vector, the stegomyia mosquito. This jungle yellow fever presents new problems regarding the transmission and control of the disease and constitutes a constant menace to urban centers.

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4. Hughes, T. P.: J. Immunol. **25**: 275 (Sept.) 1933.
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6. Hughes, T. P.; Parker, R. F., and Rivers, T. M.: J. Exper. Med. **62**: 349 (Sept.) 1935.
7. Rivers, T. M.; Haagen, E., and Muckenfuss, R. S.: J. Exper. Med. **50**: 673 (Nov.) 1929. Andrewes, C. H.: Brit. J. Exper. Path. **10**: 273 (Aug.) 1929; J. Path. & Bact. **33**: 301 (April) 1930. Downie, A. W., and McGaughey, C. A., ibid. **40**: 297 (March) 1935. Sabin, A. B.: Brit. J. Exper. Path. **16**: 84 (Feb.) 1935.
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16. Soper, F. L.; Penna, H.; Cardoso, E.; Serafim, J., Jr.; Frobisher, M., Jr., and Pinheiro, J.: Am. J. Hyg. **18**: 555 (Nov.) 1933. Soper, F. L.: Rural and Jungle Yellow Fever—A New Public Health Problem in Colombia, Bogotá, editorial, Minerva, 1935.

In 1918 a disease called swine influenza, or "hog flu," appeared in this country. Shope [17] has conclusively demonstrated that the malady as it occurs in nature is not caused by a single infectious agent but by the synergistic action of swine influenza virus and a bacillus, Haemophilus influenzae-suis. Koch's postulates have induced most investigators to hold the idea that in order to demonstrate the etiologic significance of an infectious agent it is essential to produce experimentally the disease in question by means of pure cultures of that agent. This attitude implies that each infectious disease is caused by one infectious agent. In view of such an attitude the results of Dr. Shope's work take on an added significance, because they clearly indicate that at least one disease as seen in nature can be caused only by the combined action of two infectious agents, a virus and a bacterium. Thus, the inability in the past to discover the cause of certain infectious maladies still classified as diseases of unknown etiology may be due to the fact that workers have been influenced too profoundly by the dictum of Koch.

Following the work on swine influenza begun by Shope in 1931, three British workers, Smith, Andrewes and Laidlaw,[18] succeeded in 1933 in infecting ferrets with a virus found in the nasopharyngeal washings of patients with a disease diagnosed as influenza. Without much difficulty these investigators were able by serial passages to propagate the active agent in this host. Francis [19] in New York has obtained from patients with influenza in Puerto Rico, Philadelphia, New York and Alaska a virus similar to that described by the British workers. Subsequent experiments by Francis [19] and the British workers [20] have shown that these viruses collected from widely separated epidemics are serologically identical and that patients without antibodies specific for the virus at the onset of the influenzal attacks develop them during convalescence. Francis,[19] and Andrewes, Laidlaw and Smith [21] simultaneously demonstrated that white mice are susceptible to the virus, provided a ferret-adapted strain is instilled into the nostrils while the animals are under ether anesthesia. As might be expected, this observation has greatly facilitated work on influenza.[22] Although no one has cultivated the virus on ordinary mediums, Francis and Magill [23] have succeeded in obtaining a sustained multiplication of the agent in a medium consisting of bits of viable chick embryo tissue suspended in Tyrode's solution. Furthermore, when the cultured virus is injected subcutaneously into human volunteers with few or no demonstrable neutralizing antibodies, illness similar to influenza does not occur but antibodies specific for the virus promptly appear.[24]

Swine influenza was unknown before 1918. In view of the fact that the suggestion [25] has been made that hogs contracted the malady from man during the pandemic of influenza in 1918, considerable study has been devoted to the relation of the two diseases, which has resulted in the demonstration that the swine virus and the human virus are immunologically related but not identical.[26] Furthermore, it has been shown that swine are susceptible to the virus recently isolated from man but that the disease caused by it, although similar in many respects, is not identical with that induced by the swine virus.[27] Consequently it is within the realm of possibility that the swine virus represents the pandemic strain of human influenzal virus adapted to hogs.

Kruse,[28] Foster [29] and Olitsky and McCartney [30] showed that common colds in man may be caused by a filtrable agent obtained from the nasopharyngeal washings of patients with the disease. Dochez and his co-workers [31] have amply confirmed these observations and have extended them by demonstrating that apes are susceptible and that the virus is capable of multiplication in a special medium containing viable chick embryo tissue. No one, however, has definitely shown that ferrets and mice are susceptible to the virus of common colds, and the method of its cultivation [32] is radically different from that used for cultivation [23] of the influenzal virus previously mentioned. These facts are decidedly in favor of the idea that the two viruses are different, and in the future most investigators in this field will undoubtedly consider them dissimilar unless further work yields conclusive evidence to the contrary.

At this time it is advisable to point out that one should not conclude that all cases of infection clinically diagnosed as influenza are caused by a single virus, i. e., the one recently isolated by the British and American investigators, because the viruses of yellow fever [33] and Rift Valley fever,[34] a disease of sheep, not infrequently produce in man a malady clinically indistinguishable from influenza. Moreover, Dochez [35] has obtained from cases diagnosed as influenza an active agent that tends to produce common colds in inoculated human volunteers. Finally, from many individuals suffering from an infection diagnosed as influenza no virus has been recovered. Although within recent years tremendous strides have been made in the study of common colds and influenza, much work still remains to be done before many of the problems in this field will have been mastered.

Until a few years ago, virus diseases of the central nervous system of man were not considered very common; the recognized ones consisted of rabies, poliomyelitis, Australian X disease, and epidemic encephalitis, or Economo's disease. Although the viruses of rabies

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23. Francis, Thomas, Jr., and Magill, T. P.: Science **82:** 353 (Oct. 5) 1935.

24. Francis, Thomas, Jr., and Magill, T. P.: Proc. Soc. Exper. Biol. & Med. **33:** 604 (Jan.) 1936.

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28. Kruse, W.: München. med. Wchnschr. **61:** 1547, 1914.

29. Foster, G. B., Jr.: J. Infect. Dis. **21:** 451 (Nov.) 1917.

30. Olitsky, P. K., and McCartney, J. E.: J. Exper. Med. **38:** 427 (Oct.) 1923.

31. Dochez, A. R.; Shibley, G. S., and Mills, K. C.: Proc. Soc. Exper. Biol. & Med. **26:** 562 (April) 1929; J. Exper. Med. **52:** 701 (Nov.) 1930.

32. Dochez, A. R.; Mills, K. C., and Kneeland, Yale, Jr.: Proc. Soc. Exper. Biol. & Med. **28:** 513 (Feb.) 1931; **29:** 64 (Oct.) 1931; J. Exper. Med. **63:** 559 (April) 1936.

33. Soper, F. L., and de Andrade, A.: Am. J. Hyg. **18:** 588 (Nov.) 1933.

34. Francis, Thomas, Jr., and Magill, T. P.: J. Exper. Med. **62:** 433 (Sept.) 1935.

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and poliomyelitis are well known and their activities in experimental animals have been studied extensively, the etiologic agent of epidemic encephalitis is still unknown, and the disease is placed in the virus group only by analogy because of its clinical, epidemiologic and pathologic pictures. The virus of Australian X disease [36] produced infection in experimental animals but was lost before its relation to other and better known viruses was established. Within a relatively short period, four more viruses have been shown to attack the central nervous system of man, and at least one of them is capable of causing an epidemic disease.

Two physicians have died of an encephalitis induced by a virus carried by monkeys. This agent, recently discovered and now known as the B virus,[37] is said to be related to but not identical with the viruses of herpes simplex and pseudorabies.

Louping ill is a viral disease of sheep in Scotland and the northern part of England. A number of laboratory workers have become infected [38] accidentally, some of whom manifested rather severe signs and symptoms of encephalitis, with an increased number of cells in the spinal fluid. So far as is known, no human being has died of the malady.

During the summer of 1933, more than a thousand cases of encephalitis occurred in and around St. Louis. Although it was difficult to differentiate clinically individual cases of this outbreak from individual cases of epidemic encephalitis, or Economo's disease, the epidemic as a whole manifested characteristics distinctly different from those of outbreaks of the latter malady. Muckenfuss, Armstrong and McCordock [39] succeeded without much difficulty in transmitting the disease to monkeys, and Webster and his co-workers [40] readily established it in white mice. Once a suitable experimental animal had been found, it was relatively easy to demonstrate that the infectious agent responsible for the epidemic is a small virus possessing a diameter of from 20 to 30 millimicrons. Furthermore, by means of neutralization tests conducted in mice, it has been shown [41] that individuals at the onset of the malady do not possess antibodies against the virus while they develop them during convalescence, that patients recovered from or chronically ill of Economo's encephalitis do not possess neutralizing antibodies against the St. Louis virus, that the St. Louis type of encephalitis was in the United States before 1933, and, finally, that it is still endemic and not restricted to St. Louis and its immediate vicinity.

In Japan, a disease known as summer or type B encephalitis [42] has been recognized for a number of years. Many physicians and investigators appreciate the fact that epidemics of it are distinctly different from those of Economo's (type A) encephalitis. Furthermore, the clinical, pathologic and epidemiologic aspects of this disease are in many respects strikingly similar to those of the St. Louis malady. Whether similar or identical viruses are operative in the two diseases remains to be ascertained by future investigations.

While working with material from the epidemic encephalitis in St. Louis, Armstrong and Lillie [43] encountered a new virus in monkeys. A report of their observations, in which they designated the active agent as the virus of experimental lymphocytic choriomeningitis, appeared in August 1934. Early in 1935 Traub [44] reported that he had discovered the same virus in his stock of white mice. Shortly after Traub's communication appeared, Scott and I [45] recorded the fact that we had recovered the virus from the spinal fluids of two patients who presented the picture of a mild meningitis; that is, they had fever, headache, nausea, vomiting, nuchal rigidity, Kernig's sign and a decided increase in the number of cells, mainly lymphocytes, in the spinal fluid. The infection in the two patients just mentioned was not unique, because recently we have recovered the virus from the spinal fluids of two more individuals with a nonbacterial meningitis; also from the blood of one of the patients the virus was isolated. Moreover, Findlay [46] in England has recovered the virus from mice and from the spinal fluids of two human beings. All patients from whom the virus has been isolated have made good recoveries.

In 1925 Wallgren [47] described a clinical entity which he designated as acute aseptic meningitis. Since the cases from which the virus of lymphocytic choriomeningitis has been isolated satisfy the criteria established for the diagnosis of acute aseptic meningitis, certain workers [48] have suggested that the new virus is the etiologic agent responsible for most if not all of the cases placed in Wallgren's group. The results of the work in my laboratory,[45] however, clearly indicate that only a few such cases are caused by this virus and that they should not be classified as acute aseptic meningitis but as lymphocytic choriomeningitis. One immediately asks, "What about the other cases placed under the classification of acute aseptic meningitis?" An entirely satisfactory answer is not yet available, but it is safe to say that a few may represent cases of the meningeal form of encephalitis or nonparalytic poliomyelitis, while the remainder are induced by a virus or viruses not yet discovered. In this connection it should be kept in mind that a certain number of patients with mumps also develop a meningitis or a meningoencephalitis presumably caused by the active agent inducing the parotitis which has been shown by Johnson and Goodpasture [49] to belong in the viral group.

That affairs regarding the diagnosis of viral diseases of the central nervous system should be in the state indicated by the remarks just made is understandable when the fact is taken into consideration that the nervous system is capable of responding to injury in a limited number of ways. Consequently, it is not sur-

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37. Sabin, A. B., and Wright, A. M.: J. Exper. Med. **59**: 115 (Feb.) 1934. Sabin, A. B.: Brit. J. Exper. Path. **15**: 248, 268 (Aug.), 321, 372 (Dec.) 1934. Sabin, A. B., and Hurst, E. W., ibid. **16**: 133 (April) 1935.

38. Rivers, T. M., and Schwentker, F. F.: J. Exper. Med. **59**: 669 (May) 1934.

39. Muckenfuss, R. S.; Armstrong, C., and McCordock, H. A.: Pub. Health Rep. **48**: 1341 (Nov. 3) 1933; Report on the St. Louis Outbreak of Encephalitis, Pub. Health Bull. 214, 1935.

40. Webster, L. T., and Fite, G. L.: Science **78**: 463 (Nov. 17) 1933; J. Exper. Med. **61**: 103 (Jan.), 411 (March) 1935.

41. Webster, L. T.; Fite, G. L.; Clow, A. D., and Muench, H.: J. Exper. Med. **62**: 827 (Dec.) 1935. Tucker, W. H.: Am. J. Pub. Health **26**: 268 (March) 1936.

42. Hashimoto, Hirotoshi; Kudo, Masashiro, and Uraguchi, Kenji: Experiences in the Summer Epidemics of Acute Encephalitis in Tokyo, J. A. M. A. **106**: 1266 (April 11) 1936.

43. Armstrong, Charles, and Lillie, R. D.: Pub. Health Rep. **49**: 1019 (Aug.) 1934.

44. Traub, Erich: Science **81**: 298 (March 22) 1935; J. Exper. Med. **63**: 533 (April) 1936.

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46. Findlay, G. M.; Alcock, N. S., and Stern, R. O.: Lancet **1**: 650 (March 21) 1936.

47. Wallgren, A.: Acute paediat. **4**: 158, 1925.

48. Armstrong, Charles, and Dickens, P. F.: Pub. Health Rep. **50**: 831 (June 21) 1935.

49. Johnson, C. D., and Goodpasture, E. W.: J. Exper. Med. **59**: 1 (Jan.) 1934; Am. J. Hyg. **21**: 46 (Jan.) 1935. Findlay, G. M., and Clarke, L. P.: Brit. J. Exper. Path. **15**: 309 (Oct.) 1934.

prising that different viruses attacking the central nervous system cause diseases with clinical pictures so similar that a differential diagnosis is difficult or impossible by means of clinical observations alone. This not only is true of viral diseases but also holds in regard to bacterial maladies. For instance, without the microscope and methods of bacterial cultivation, it would still be impossible to differentiate one type of pyogenic meningitis from another with any degree of accuracy.

VACCINES AND SERUMS

Physicians probably would like to know whether there are safe and effective vaccines and immune serums for the prevention and cure, respectively, of viral diseases of the central nervous system of man. Except for vaccines against rabies, there are none that I [50] would administer to my patients.

Although the use of vaccines and serums at present offers little of value in the prevention and treatment of poliomyelitis, the results of work with agents of another nature seem to present hope that a method of controlling the disease eventually may be evolved. It is now believed that the virus of poliomyelitis enters the brain from the nasal mucous membranes by way of the olfactory nerve. With this idea in mind, a number of workers have conducted experiments with several viruses in more than one host in order to ascertain whether the entrance of a neurotropic virus into the central nervous system can be blocked by the application of simple chemical substances to the mucous membranes of the nose.

In 1934 Olitsky and Cox [51] demonstrated that mice which had received a number of intranasal instillations of tannic acid were temporarily resistant to the action of equine encephalomyelitic virus placed in the nose. In 1935 Armstrong [52] reported the results of experiments in which he found that a solution of sodium alum produced an effect similar to that of tannic acid, in that local applications of it protected mice subsequently inoculated intranasally with the virus of the St. Louis type of encephalitis. Then Armstrong and Harrison,[53] and Sabin, Olitsky and Cox [54] showed that monkeys following repeated intranasal spraying of alum were resistant to the virus of poliomyelitis implanted on the nasal mucous membranes. Finally, Armstrong and Harrison [55] and Schultz and Gebhardt [56] found that a dilute solution of trinitrophenol may be substituted for alum.

From the results of the work just described, one can predict with a degree of certainty that during the coming summer experiments will be made in the field in the hope that progress in the prevention of poliomyelitis in man will be achieved. Let me suggest, however, that this type of experiment should be conducted only by those who have had proper training.

In this discussion it has been necessary to omit mention of many interesting activities and newly discovered facts. The material presented was chosen with the thought that it would illustrate the ascendant ideas in the minds of investigators in the field of viruses and supply information of value in the practice of medicine.

Sixty-Sixth Street and York Avenue.

50. Rivers, T. M.: Am. J. Pub. Health **26:** 136 (Feb.) 1936.
51. Olitsky, P. K., and Cox, H. R.: Science **80:** 566 (Dec. 14) 1934.
52. Armstrong, Charles: Pub. Health Rep. **50:** 43 (Jan. 11) 1935.
53. Armstrong, Charles, and Harrison, W. T.: Pub. Health Rep. **50:** 725 (May 31) 1935.
54. Sabin, A. B.; Olitsky, P. K., and Cox, H. R.: J. Bact. **31:** 35 (Jan.) 1936; J. Exper. Med. **63:** 877 (June) 1936.
55. Armstrong, Charles, and Harrison, W. T.: Pub. Health Rep. **51:** 203 (Feb. 28) 1936.
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Council on Pharmacy and Chemistry

REPORTS OF THE COUNCIL

Nomenclature of Endocrine Principles: II.

THE PRESENT UNSETTLED STATE OF ENDOCRINOLOGIC NOMENCLATURE HAS BEEN THE CAUSE OF INCREASING CONFUSION IN RECENT YEARS. IN AN EFFORT TO REMEDY THIS DEPLORABLE SITUATION, THE COUNCIL SOLICITED THE COOPERATION OF A NUMBER OF EXPERTS WHO HAVE MADE FUNDAMENTAL CONTRIBUTIONS TO GLANDULAR PHYSIOLOGY. THIS GROUP, TERMED THE ADVISORY COMMITTEE ON THE NOMENCLATURE OF ENDOCRINE PRINCIPLES, IS COMPOSED OF THE FOLLOWING: DRS. EDGAR ALLEN, WILLARD M. ALLEN, J. B. COLLIP, G. W. CORNER, E. A. DOISY, E. T. ENGLE, H. M. EVANS, R. T. FRANK, F. L. HISAW, F. C. KOCH, LEO LOEB, G. F. MARRIAN, C. R. MOORE, OSCAR RIDDLE, P. E. SMITH AND C. W. TURNER; M. S. BISKIND, CORRESPONDING SECRETARY. ON THE RECOMMENDATION OF THIS COMMITTEE, THE COUNCIL HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORT, WHICH IS THE SECOND OF A SERIES (THE FIRST, ON THE NOMENCLATURE OF THE CORPUS LUTEUM HORMONE, APPEARED IN THE JOURNAL, MAY 23, 1936, PAGE 1808). IT IS ANTICIPATED THAT OTHER REPORTS ON RELATED TOPICS WILL BE PUBLISHED IN THE NEAR FUTURE.

THE COUNCIL DESIRES TO EXPRESS ITS SINCERE APPRECIATION TO THE MEMBERS OF THE ADVISORY COMMITTEE FOR THEIR WILLING COOPERATION.

PAUL NICHOLAS LEECH, Secretary.

THE NOMENCLATURE OF "MALE HORMONES"

The first successful preparations of male hormone were obtained by McGee [1] (1927) in the lipoid fraction of extracts of bull testes. This crude extract was further refined by Gallagher and Koch [2] (1929, 1930, 1934, 1935); the extracts proved capable of inducing growth of the capon comb (McGee, Juhn and Domm,[3] 1928) and preventing, or repairing, castration damage on the accessory reproductive organs of mammals (Moore and McGee,[4] 1928; Moore and Gallagher,[5] 1930; Moore, Hughes and Gallagher,[6] 1930; Moore, Price and Gallagher,[7] 1930; Vatna,[8] 1930; Heller,[9] 1932). The active principle has been referred to variously as "bull testis extract," "male hormone from testes," "comb-growth-promoting substance" and "the testicular (or testis) hormone."

Loewe and Voss [10] (1929) published accounts of extractions of testicular substance and the effects of resultant preparations on mammalian accessory reproductive organs. Their extracts were crude mixtures and the active principle was called "androkinin."

Funk and Harrow [11] (1929) obtained crude extracts of male urine that caused growth of the capon comb and designated the active principle in their products "the male hormone."

The active principle in extracts of urine has been studied in many other laboratories and has also been referred to as "male

1. McGee, L. C.: The Effect of the Injection of a Lipoid Fraction of Bull Testicle in Capons, Proc. Inst. Med., Chicago **6:** 242, 1927.
2. Gallagher, T. F., and Koch, F. C.: The Testicular Hormone, J. Biol. Chem. **84:** 495 (Nov.) 1929; The Quantitative Assay for the Testicular Hormone by the Comb Growth Reaction, J. Pharmacol. & Exper. Therap. **40:** 327 (Nov.) 1930; The Effect of Alkali on the Testicular Hormone, J. Biol. Chem. **104:** 611 (March) 1934; Biochemical Studies on the Male Hormone as Obtained from Urine, Endocrinology **18:** 107 (Jan.-Feb.) 1934; The Quantitative Assay for Testicular Hormone by the Comb-Growth-Reaction: Second Communication, J. Pharmacol. & Exper. Therap. **55:** 97 (Sept.) 1935. Gallagher, T. F.; Koch, F. C., and Dortman, R. I.: Procedure for Quantitative Extraction of Sex Hormones from Urine, Proc. Soc. Exper. Biol. & Med. **33:** 440 (Dec.) 1935.
3. McGee, L. C.; Juhn, Mary, and Domm, L. V.: The Development of Secondary Sex Characters in Capons by Injections of Extracts of Bull Testes, Am. J. Physiol. **87:** 406 (Dec.) 1928.
4. Moore, C. R., and McGee, L. C.: On the Effects of Injecting Lipoid Extracts of Bull Testes into Castrated Guinea-Pigs, Am. J. Physiol. **87:** 436 (Dec.) 1928.
5. Moore, C. R., and Gallagher, T. F.: Seminal Vesicle and Prostate as a Testis-Hormone Indicator: The Electric Ejaculation Test, Am. J. Anat. **45:** 39 (Jan.) 1930.
6. Moore, C. R.; Hughes, Winifred, and Gallagher, T. F.: Rat Seminal Vesicle Cytology as a Testis-Hormone Indicator and the Prevention of Castration Changes by Testis-Extract Injections, Am. J. Anat. **45:** 109 (Jan.) 1930.
7. Moore, C. R.; Price, Dorothy, and Gallagher, T. F.: Rat Prostate Cytology as a Testis-Hormone Indicator and the Prevention of Castration Changes by Testis-Extract Injections, Am. J. Anat. **45:** 71 (Jan.) 1930.
8. Vatna, S.: Rat Vas Deferens Cytology as a Testis Hormone Indicator and the Prevention of Castration Changes by Testis Hormone Injections, Biol. Bull. **58:** 322 (June) 1930.
9. Heller, R. E.: Cowper's Gland and Its Reaction to Castration and to Different Sex Hormone Conditions, Am. J. Anat. **50:** 73 (March) 1932.
10. Loewe, S., and Voss, H. E.: Gewinnung, Eigenschaften und Testierung eines männlichen Sexualhormons, Sitz. Akad. Wiss. Wien (Math-Naturw. Kl.) Akad. Anz., 1929, No. 20.
11. Funk, Casimir, and Harrow, B.: The Male Hormone, Proc. Soc. Exper. Biol. & Med. **26:** 325 (Jan.) 1929.

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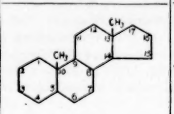
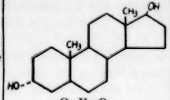
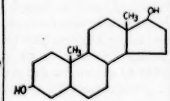
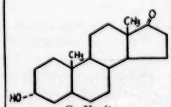
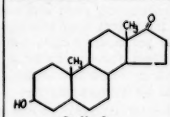
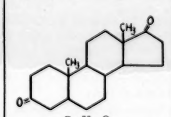
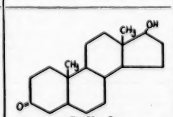
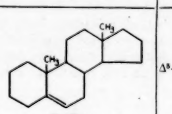
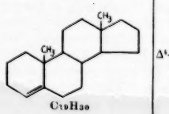
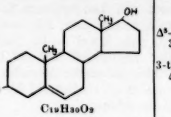
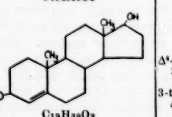
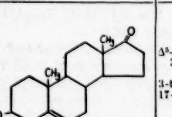
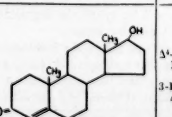
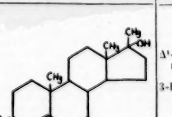
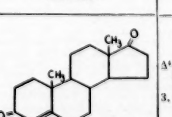
Terminology for Androgens

Common Name	Structure	Chemical Name*
Androstane	 $C_{19}H_{32}$	Androstane
Dihydro-androsterone	 $C_{19}H_{32}O_2$	Androstanediol-3-cis, 17 or 3-cis, 17-dihydroxy androstane
Isodihydro-androsterone	 $C_{19}H_{32}O_2$	Androstanediol-3-trans, 17 or 3-trans, 17-dihydroxy androstane
Androsterone	 $C_{19}H_{30}O_2$	Androstanolone-3-cis, 17 or 3-cis-hydroxy 17-keto androstane
Iso-androsterone	 $C_{19}H_{30}O_2$	Androstanolone-3-trans, 17 or 3-trans-hydroxy 17-keto androstane
Androstanedione	 $C_{19}H_{28}O_2$	Androstanedione-3, 17 or 3, 17-diketo androstane
.....	 $C_{19}H_{30}O_2$	Androstanolone-17, 3 or 3-keto 17-hydroxy androstane

Common Name	Structure	Chemical Name
Androstenes	 $C_{19}H_{30}$	Δ^5-Androstene
	 $C_{19}H_{30}$	Δ^4-Androstene
Androstenediols	 $C_{19}H_{30}O_2$	Δ^5-Androstenediol-3-trans, 17 or 3-trans, 17-dihydroxy Δ^5-androstene
	 $C_{19}H_{30}O_2$	Δ^4-Androstenediol-3-trans, 17 or 3-trans, 17-dihydroxy Δ^4-androstene
Dehydro-androsterone or Dehydro-iso-androsterone	 $C_{19}H_{28}O_2$	Δ^5-Androstenolone-3-trans, 17 or 3-trans-hydroxy 17-keto Δ^5-androstene
Testosterone	 $C_{19}H_{28}O_2$	Δ^4-Androstenolone-17, 3 or 3-keto 17-hydroxy Δ^4-androstene
Methyl testosterone	 $C_{20}H_{30}O_2$	Δ^4-17-methyl-androstenolone-17, 3 or 3-keto 17-methyl-hydroxy Δ^4-androstene
Androstenedione	 $C_{19}H_{28}O_2$	Δ^4-Androstenedione-3, 17 or 3, 17-diketo Δ^4-androstene

* The chemical nomenclature in this table is given in two forms. The first is the one in almost exclusive use in the literature; the second is in accord with the rule in the Definitive Report of the Commission on the Reform of the Nomenclature of Organic Chemistry (J. Am. Chem. Soc. 55: 3905 [Oct.] 1933) requiring that only the principal function be expressed in the suffix, all others to be designated by appropriate prefixes. The latter method is the one employed in the chemical terminology of the closely related estrogenic compounds; for consistency as well as conformity with the aforementioned international agreement, it should be adopted for the androgens as well.

hormone from urine" (Gallagher and Koch[2]), "androkinin" (Loewe and Voss), "androtin" (McCullagh[12]), "comb-growth-promoting substance" (Dodds, Greenwood, Allan and Gallimore[13]).

A further hypothetical substance from the testicle, believed to emanate from the germinal epithelium and to act quite specifically on the pituitary gland, has been called by McCullagh[12] "inhibin". It is still questionable whether such a substance exists.

All preparations thus far mentioned have been mixtures of various degrees of purity.

In 1931 Butenandt[14] obtained a pure crystalline substance from human male urine which stimulates the growth of the capon comb and acts on male accessory reproductive organs in mammals. In 1934 Butenandt and Tscherning[15] showed the pure substance to be an oxyketone, melting point 178 C., of the formula $C_{19}H_{28}O_2$. They named it "androsterone." This substance was subsequently prepared by synthetic degradation of cholesterol by Ruzicka, Goldberg, Meyer, Brungger and Eichenberger[16] (1934) and by others.

In 1934 Butenandt and Dannenbaum[17] also obtained from male urine extracts a second pure substance $C_{19}H_{28}O_2$, melting point 148 C., which was found to be "dehydro-androsterone" and to have similar physiologic actions but requiring much greater amounts. This substance likewise has been prepared by synthetic degradation of cholesterol by Ruzicka and Wettstein[18] (1935) and by others.

The suggestion that the male hormones from urine and from testicular tissue respectively are different came from both the chemical and the physiologic aspects. Gallagher and Koch[2] (1934) showed that the hormone in testis extracts was destroyed when treated with boiling alkali whereas the principle from urine retained its activity after such treatment. Quantitative physiologic studies revealed that equivalent capon units of testis extract and of urine extract produced markedly different responses in mammals (Laqueur, de Fremery, Freud, de Jongh, Köber, Luchs and Munch,[19] 1931; Freud,[20] 1934; Dingemanse, Freud and Laqueur,[21] 1935).

In 1935 David, Dingemanse, Freud and Laqueur[22] obtained a pure crystalline preparation from testis tissue, melting point 154 C., which was alkali labile and which per unit weight corresponded to the activity of highly purified concentrates obtained from testis extracts. It was many times more effective on mammalian tissues than androsterone. This pure crystalline material was designated "testosterone." The substance was prepared from cholesterol by synthetic degradation by Ruzicka and Wettstein[23] (1935) and by others.

The investigations on the male hormones have advanced to the point at which three chemically pure substances have been obtained from urine and testis tissue; a number of related compounds have been obtained by modifying these substances or by synthetic degradation studies on the sterols and bile acids. The physiologic potencies of the naturally occurring compounds and of some of the other substances have been determined.

On the recommendation of the Advisory Committee on the Nomenclature of Endocrine Principles, the Council on Pharmacy and Chemistry adopted the following terms:

(*a*) *Androsterone* to designate the chemically pure hormone $C_{19}H_{30}O_2$, melting point 178 C., obtained from urine (international unit 100 micrograms as assayed by comb growth response in the capon).

(*b*) *Dehydro-androsterone* to designate the chemically pure hormone $C_{19}H_{28}O_2$, melting point 148 C., obtained from urine (capon unit approximately five times the dose of androsterone).

(*c*) *Testosterone*[24] to designate the chemically pure hormone $C_{19}H_{28}O_2$, melting point 154 C., obtained from testis tissue (capon unit from one-tenth to one-sixth the dose of androsterone).

(*d*) *Androgen* to designate substances possessing masculinizing[25] activity. Urinary androgens, testicular androgens or androgenic substances from plant or other sources may or may not contain androsterone, dehydro-androsterone or testosterone.

The structures, empirical formulas and the common and chemical names of the androgens are given in the accompanying table.

Although the international unit is based on comb growth response in capons, it should be emphasized that this method of assay does not necessarily express the quantitative physiologic activities of different preparations on mammals. Therefore it is highly desirable to determine the physiologic activities of new pure or crude preparations by assays on mammals as well.

Committee on Foods

THE COMMITTEE HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORTS. FRANKLIN C. BING, Secretary.

BLUBAUGH'S GENUINE GLUTEN BREAD
NOT ACCEPTED

The Blubaugh Retail Bakeries, Charleston, W. Va., presented for consideration of the Committee gluten bread prepared from gluten flour, water, shortening, yeast and salt. In accordance with the submission the gluten flour contains on a water-free basis not less than 7.1 per cent nitrogen, not more than 56 per cent nitrogen-free extract (protein factor 5.7) and not more than 44 per cent starch as determined by the diastase method.

Analysis (submitted by manufacturer).—

	per cent
Moisture	31.13
Fat	6.71
Ash	1.33
Crude fiber	0.66
Nitrogen-free extract	30.40
Starch by diastase method	21.72
Direct reducing sugar as dextrose	1.12
Sucrose	0.08
Protein (N × 5.7)	29.77

Calories.— 3 per gram; 86 per ounce.

Claims of Manufacturer.—A piece of advertising used in the promotion of this product states:

"Blubaugh's Genuine Gluten Bread for Anemia, Diabetes and Over-Weight. Every anemic person should eat Blubaugh's Genuine Gluten Bread regularly to build rich Red Blood. The vitamins, mineral salts and food iron contribute to better health. Every diabetic person should eat Blubaugh's Genuine Gluten Bread. Diabetics must eat sparingly of starchy foods. Gluten Bread supplies the right ingredients. In severe cases, consult your physician. Every over-weight person will find Blubaugh's Genuine Gluten Bread a simple effective way of reducing. Because of its protein content, it supplies needed nourishment and strength."

12. McCullagh, D. R.: Dual Endocrine Activity of the Testes, Science **76**: 19 (July 1) 1932.
13. Dodds, E. C.; Greenwood, A. W.; Allan, H., and Gallimore, E. J.: Properties of the Comb-Growth-Promoting Substance Obtained from Testicles and Urine, Biochem. J. **24**: 1031, 1930.
14. Butenandt, Adolf: Ueber die chemische Untersuchung der Sexualhormone, Ztschr. f. angew. Chem. **44**: 905, 1931.
15. Butenandt, Adolf, and Tscherning, K.: Androsteron—ein krystallinisches männliches Sexhormon: Isolierung und Reinigung aus männlichen Harn, Ztschr. f. physiol. Chem. **229**: 167 (Nov. 23) 1934.
16. Ruzicka, L.; Goldberg, M. W.; Meyer, Brungger, H., and Eichenberger, E.: Zur Kenntnis der Sexualhormone: II. Ueber die Synthese des Testikelhormons (Androsteron) und Stereoisomerer desselben durch Abbau hydrierter Sterine, Helv. chim. acta **17**: 1395, 1934.
17. Butenandt, Adolf, and Dannenbaum, Hans: Isolierung eines neuen physiologish unwirksamen Sterin Derivate aus Männerharn: Seine Verknüpfung mit Dehydro-androsteron und Androsteron, Ztschr. f. physiol. Chem. **229**: 192 (Nov. 23) 1934.
18. Ruzicka, L., and Wettstein, A.: V. Künstliche Herstellung des männlichen Sexualhormons Trans-dehydro-androsteron und des Androsten 3,17-dions, Helv. chim. acta **18**: 986, 1935.
19. Laqueur, E.; de Fremery, P.; Freud, J.; de Jongh, S. E.; Köber, S.; Luchs, A., and Munch, A. P.: Einheit oder Mehrheit männlicher Sexualhormone, Berichte über d. ges. Physiol. **61**, Nos. 3-4, 1931.
20. Freud, J.: Demonstration of the Difference Between "Male Hormone" Extracts from Urine and from Testicles in Hypophysectomized Rats, Acta Brevia Neerl. **4**: 145, 1934.
21. Dingemanse, E.; Freud, J., and Laqueur, E.: Difference Between Male Hormone Extracts from Urine and from Testes, Nature **135**: 184 (Feb. 2) 1935.
22. David, K.; Dingemanse, E.; Freud, J., and Laqueur, E.: Ueber krystallinisches männliches Hormon aus Hoden (Testosteron), wirksamer als aus Harn oder aus Cholesterin bereitetes Androsteron, Ztschr. f. physiol. Chem. **233**: 281 (June 7) 1935.
23. Ruzicka, L., and Wettstein, A.: VII. Ueber die künstliche Herstellung des Testikelhormons Testosteron (Androsten-3-on-17-ol), Helv. chim. acta. **18**: 1264, 1935.
24. While it might be considered advisable to retain the same root for testosterone as for the other compounds, it does not seem feasible to devise a name based on "andro-" that would be sufficiently distinctive yet not too cumbersome for general use.
25. The term "masculinizing" is here used in a restricted sense, referring to capon comb growth stimulating activity and other effects employed in assaying these products such as are described by C. R. Moore in Glandular Physiology and Therapy, Chicago, American Medical Association, 1935, pages 258 to 261, and by Korenchevsky and his associates (Korenchevsky, Vladimir: The Assay of Testicular Hormone Preparations, Biochem. J. **26**: 413, 1932; Castrated Rats for the Assay of Testicular Hormone, ibid. **26**: 1300, 1932. Korenchevsky, Vladimir; Dennison, Marjorie, and Kohn-Speyer, Alice: The Rat Unit of Testicular Hormone, ibid. **26**: 2097, 1932).

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It is obvious that such claims as these are unscientific and exaggerated. The public should be informed that gluten bread is not a proper source for obtaining elements to "build rich blood" or for adequate supplies of vitamins and mineral salts. Gluten bread was originally devised for a means of providing bread without starch. However, experience has shown that gluten bread has no place in the diet of the average diabetic patient.

As has been stated before by the Committee on Foods (THE JOURNAL, Nov. 23, 1935) commercially prepared special diabetic foods are of little use to the diabetic patient. In general, the diet of the patient with diabetes should be exactly prescribed by a physician, who, in addition, has insulin at his command.

Furthermore, diabetic foods often run high in protein, which in some cases may be tolerated almost as poorly, if not quite as poorly, as starch in diabetes.

The Committee on Foods has declared, therefore, that Blubaugh's Genuine Gluten Bread is not acceptable for inclusion in the list of accepted foods.

ACCEPTED FOODS

THE FOLLOWING PRODUCTS HAVE BEEN ACCEPTED BY THE COMMITTEE ON FOODS OF THE AMERICAN MEDICAL ASSOCIATION FOLLOWING ANY NECESSARY CORRECTIONS OF THE LABELS AND ADVERTISING TO CONFORM TO THE RULES AND REGULATIONS. THESE PRODUCTS ARE APPROVED FOR ADVERTISING IN THE PUBLICATIONS OF THE AMERICAN MEDICAL ASSOCIATION, AND FOR GENERAL PROMULGATION TO THE PUBLIC. THEY WILL BE INCLUDED IN THE BOOK OF ACCEPTED FOODS TO BE PUBLISHED BY THE AMERICAN MEDICAL ASSOCIATION.

FRANKLIN C. BING, Secretary.

A. 1. JUST RIGHT FLOUR (BLEACHED)
2. SAXONY CHOICE SOFT WHEAT FLOUR (BLEACHED)
3. SOUTHERN BELLE FLOUR (BLEACHED)

B. 1. JUST RIGHT FLOUR PHOSPHATE ADDED (BLEACHED)
2. SAXONY CHOICE SOFT WHEAT FLOUR PHOSPHATE ADDED (BLEACHED)
3. SOUTHERN BELLE FLOUR PHOSPHATE ADDED (BLEACHED)

C. 1. CHARMER SELF-RISING FLOUR (BLEACHED)
2. JUST RIGHT SELF-RISING FLOUR (BLEACHED)
3. SAXONY SELF-RISING FLOUR (BLEACHED)

Manufacturer.—The Saxony Mills, Inc., St. Louis.

Descriptions.—A. 1. Patent flour prepared from hard wheat; bleached. 2 and 3. Patent flour prepared from soft red winter wheat; bleached.

B. 1. Patent flour prepared from hard wheat with 0.5 per cent of monocalcium acid phosphate; bleached. 2 and 3. Patent flour prepared from soft red winter wheat with 0.5 per cent of monocalcium acid phosphate; bleached.

C. 1, 2 and 3. Self-rising flour containing a patent flour of soft winter wheat (bleached), monocalcium acid phosphate, sodium bicarbonate and salt.

Manufacture.—A. Selected wheat is cleaned, scoured, tempered and milled by essentially the same procedures as described in THE JOURNAL, June 18, 1932, page 2210. Chosen flour streams are blended, bleached with nitrogen trichloride (from 2.5 to 3.5 Gm. per 196 pounds) and with a mixture of benzoyl peroxide and calcium phosphate (1 part to 50,000 parts of flour).

B. Selected wheat is cleaned, scoured, tempered and milled by essentially the same procedures as described in THE JOURNAL, June 18, 1932, page 2210. Chosen flour streams are blended, bleached with nitrogen trichloride (from 2.5 to 3.5 Gm. per 196 pounds) and with a mixture of benzoyl peroxide and calcium phosphate (one part to 50,000 parts of flour), and finally mixed with 0.5 per cent monocalcium acid phosphate.

C. The ingredients are mixed in definite proportions in a batch mixer and automatically sealed in paper and cotton sacks.

CELLU BRAND GREEN CUT ASPARAGUS, WATER PACKED

Distributor.—Chicago Dietetic Supply House, Inc., Chicago.

Packer.—L. H. Schlecht, Rossville, Ill.

Description.—Canned green cut asparagus packed in water.

Manufacture.—Essentially the same as Cellu Brand Tips of Asparagus, Water Packed (THE JOURNAL, April 25, 1936 p. 1473) except that tips are 1½ inches and stems cut in pieces of 1¼ inches.

Analysis (submitted by distributor).—

	per cent
Moisture	95.1
Total solids	4.9
Ash	0.6
Fat (ether extract)	0.2
Protein (N × 6.25)	1.5
Crude fiber	0.7
Starch (diastase method)	1.7
Carbohydrates other than crude fiber (by difference)	1.9

Calories.—0.2 per gram; 6 per ounce.

Claims of Manufacturer.—Choice quality green cut asparagus packed without added sugar or salt. For use in special diets in which sugar or salt is proscribed or in quantitative diets of calculated composition.

STEPHENS BRAND ORANGE JUICE

Manufacturer.—Natural Food Products Company, Orange, Calif.

Description.—Canned California Valencia orange juice, retaining in high degree the original vitamin C content.

Manufacture.—Same as Stephens Brand Grapefruit Juice (THE JOURNAL, May 16, 1936, p. 1735).

Analysis (submitted by manufacturer).—

	per cent
Moisture	86.4
Total solids	13.6
Ash	0.4
Fat (ether extract)	0.1
Protein (N × 6.25)	1.0
Reducing sugars as invert sugar	5.4
Nonreducing sugars as sucrose	4.3
Crude fiber	0.1
Carbohydrates other than crude fiber (by difference)	11.0
Titratable acidity as citric acid	1.0

Calories.—0.5 per gram; 14 per ounce.

Vitamins.—Chemical determination (iodine titration) of cevitamic (ascorbic) acid shows 0.6 mg. per cubic centimeter.

Claims of Manufacturer.—Practically equivalent to fresh juice in vitamin C. For all table and dietary uses of fresh juice.

SANITARIUM BRAND WATER PACKED PINEAPPLE SLICED AND TID-BITS

Distributor.—Battle Creek Food Company, Battle Creek, Mich.

Manufacturer.—Hawaiian Pineapple Company, Limited, San Francisco.

Description.—Peeled, cored and sliced Hawaiian pineapple, processed and packed in water, same as Dole Brand Hawaiian Pineapple, Water Packed, Sliced and Tid-bits (THE JOURNAL, March 14, 1936, p. 923).

Claims of Manufacturer.—Fancy grade canned sliced pineapple, representing fruit most uniform in color, flavor, texture and workmanship. Packed in water. The canned product is practically equivalent to the fresh fruit in nutritional values (vitamin C slightly reduced).

FAULTLESS BRAND TOMATO JUICE

Distributor.—Nash-Finch Company, Pawhuska, Okla.

Manufacturer.—Marshall Canning Company, Marshalltown, Iowa.

Description.—Tomato juice seasoned with salt retaining in high degree the natural mineral and vitamin values. The same as Faultless Brand Tomato Juice (THE JOURNAL, April 4, 1936, p. 1166).

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

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SATURDAY, JULY 18, 1936

BACTERIAL NOMENCLATURE

The confusion in classifications of "genera" and "species" of bacteria has not become materially less in recent years. Indeed, in the opinion of some bacteriologists, the multiplication of new generic names has made confusion worse confounded. The question of bacterial nomenclature will never be settled satisfactorily without some form of international agreement, and little progress has yet been made in this direction. Pending some general agreement by world bacteriologists it would seem desirable to maintain a conservative position, at least with regard to the hasty adoption of new names. Several instances are afforded in recent American practice. The term "Pfeifferella" as a bacterial genus including the glanders bacillus and certain related organisms was proposed some years ago but has not won general acceptance and has been abandoned in the fourth edition of Bergey's Manual of Determinative Bacteriology. A new genus "Listerella" is listed in the fourth edition of Bergey's Manual (1934) but this "genus" seems to have been established without any very extensive cooperative discussion. The sole organism described [1] in this genus, "L. monocytogenes," has apparently not been studied by any considerable number of bacteriologists with a view to determining its affinities and systematic position.

The precise status of Bergey's Manual as an arbiter of bacterial nomenclature has been frequently misunderstood and misinterpreted. Although the classification that it gives has been largely worked out with the aid of a committee of the Society of American Bacteriologists, the classification as a whole or in part has never been the subject of official action by the Society of American Bacteriologists and is not known to represent the matured opinion of even a majority of the members of the society. Although this fact has been frequently stated, the nomenclature and classification laid down in the manual have been taken in many quarters to represent a usage recommended by the society. It is not believed that it is the intention of the society to propose a definitive classification of bacteria irrespective of international usage and agreement.

For the time being it seems reasonable to hold that considerable effort should be directed toward diminishing rather than increasing multiplicity of names. The recent proposal of two experienced and well known American systematists [2] that the generic name Bacterium be retained as a temporary designation for non-spore forming, rod shaped bacteria, whose relationships to other bacteria are not clear, will therefore be widely welcomed. For the present, as suggested by these writers, it is probably less confusing for those engaged in bacteriologic studies to use the terms Bacterium coli, Bacterium aerogenes, Bacterium violaceum, Bacterium amylovorum, Bacterium zopfii, Bacterium monocytogenes (not Listerella monocytogenes!), Bacterium pneumoniae and so on. In a word, until proper generic criteria and accepted names are established by international agreement, it seems wise to refrain from the hasty invention and use of new names. Salmonella, Pasteurella and Brucella have already won wide acceptance, but not Pfeifferella, Listerella and Escherichia.

1. Pirie, J. H. H.: Pub. S. African Inst. M. Research **3**: 163 (March) 1927.

2. Breed, R. S., and Conn, H. J.: J. Bact. **31**: 517 (May) 1936.

THE NEW AMERICAN MEDICAL DIRECTORY

The Fourteenth Edition of the American Medical Directory has been completed and copies are now available for general distribution.

The directory, with nearly twenty-five hundred pages, is a vast storehouse of information. It contains not only the most complete list available of the physicians of the United States and its dependencies and of Canada, but much additional data which hospitals, libraries and various other institutions, as well as individuals, will find useful and readily available. The directory is the only nation-wide register of physicians in which the extensive data on medical education, licensure and society affiliations have been verified.

The 1936 edition contains 183,312 names, or 4,796 more than were in the previous edition issued in 1934. The names of 13,157 physicians have been added and 7,684 names have been removed because of death. More than 70,000 changes of address have been made, in addition to thousands of changes in society affiliations, teaching positions, specialties and office hours.

In this edition, thirty-two states show an increase in the number of physicians; New York leads the list with 1,201, followed by California (369), Pennsylvania (281), New Jersey (262) and Massachusetts (249). A slight decrease in the number of physicians is shown in Missouri, Georgia, Kentucky, Tennessee, Oklahoma, Alabama, Indiana, South Dakota, Maine, Vermont, Mississippi and New Hampshire. When the thousands of changes of location are analyzed they seem to show a noticeable migration of physicians to

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the larger towns in the South Central states, a trend that was previously present also in some other sections of the country.

The first section of 221 pages in the new directory includes the constitution and by-laws of the American Medical Association, the Principles of Medical Ethics, and a list of meeting places of the annual sessions of the Association since the first one in 1847, with the names of the President installed during each meeting. In this section also are lists of the hospitals that are approved for intern training, the medical libraries, the medical journals published in the United States, Canada, the Philippine Islands and Puerto Rico, the names of medical officers of the various government services, the national organizations for the various specialties with the names of their members, the membership of the new examining boards for the specialties, the medical schools in the United States and Canada with a brief history of each, and the members of the National Board of Medical Examiners.

The second section is arranged by states. There is published under each state the medical practice act, the members of the board of medical examiners, members of the state board of health, county and city health officers, and officers of the state, district and county medical societies. Following this is a list of 7,220 hospitals, sanatoriums and related institutions arranged by towns, with the name, location, bed capacity, superintendent, and type of patients treated in each institution. Then, arranged by towns, comes the great list of physicians, giving the year of birth, school, year of graduation and license to practice, membership in the state society and special societies, professorships, and Fellowship in the American Medical Association. The home and office addresses and office hours also are given for physicians in towns of more than 10,000 population.

A new feature in this edition is a key letter showing that a physician has been certified as a specialist by an approved examining board. Several of these boards have been approved by the Council on Medical Education and Hospitals since the directory went to press. The next edition therefore will contain a more complete list of certified specialists. An especially interesting feature of the 1936 edition is the list of American physicians temporarily located in foreign countries.

The third section, of 525 pages, is an alphabetical index of the names of 183,312 physicians; and practically every name is followed by the name of the city and state, thus indicating where in the directory detailed information about the individual physician may be found.

The bringing to completion of the Fourteenth Edition of the American Medical Directory has been a monumental task, in the pursuance of which thousands of individuals, societies, licensing boards, medical colleges and other organizations have cooperated. For their ready cooperation and assistance the American Medical Association is thankful and deeply appreciative.

MILK CONSTITUENTS AND THE EFFECTIVENESS OF VITAMIN D

As was pointed out recently in these columns,[1] milk has become increasingly popular during the last few years as a vehicle for vitamin D as "yeast milk," fortified milk or irradiated milk. Although there is still some question regarding the relative merits of these three forms, current agreement appears to favor the view that vitamin D milk in general is particularly effective as an antirachitic agent. Several explanations of its peculiar efficacy have been proposed: that different forms of vitamin D exist and that the predominating type in milk is especially effective; that the potency of vitamin D from animal origin exceeds that of the substance from plant origin; that the inherent calcium and phosphorus or the cholesterol content of milk is of primary importance.

Recently an attempt has been made [2] to ascertain the identity of the constituent or constituents of milk concerned in endowing this fluid with added antirachitic potency. Calcium and phosphorus were found to play no part, since the addition of these minerals in amounts consumed in milk to the vitamin D-supplemented ration produced no increase in antirachitic potency over that obtained with the vitamin-supplemented basal ration alone. Likewise, the fact that there is no parallelism between the fat content of milk and its antirachitic activity seemed to minimize the possibility that some lipid constituent of milk was involved. Thus there remained only certain constituents dissolved in or dispersed in the aqueous phase of milk for consideration. Since in earlier work [3] the observation had been made that some lipid material bound as a prosthetic group to lactalbumin became antirachitically active when irradiated, a special study was made of the effect on the potency of vitamin D of dispersion in a colloidal suspension of purified lactalbumin. The results were rather striking. A definite increase in the antirachitic activity of "pure" vitamin D was observed following its dispersion in this medium. The increase in potency was particularly marked when specially prepared, lipid-free lactalbumin was employed. Further work seemed to indicate that some type of a firm union between the vitamin preparation and lactalbumin had occurred since, within limits, lactalbumin quantitatively retained all the vitamin D activity of the added material and since the retained antirachitic substance could not be removed by thorough washing. As would be expected, a similar enhancement in the antirachitic potency of vitamin D was obtained when a water-miscible solution of the vitamin was treated with skim milk or whole milk. However, there was little increase in the potency of an oily solution of the vitamin when treated with milk under comparable conditions.

1. Vitamin D Milk, editorial, J. A. M. A. **106**: 1664 (May 9) 1936.
2. Supplee, G. C.; Ansbacher, S.; Bender, R. C., and Flanigan, G. E.: The Influence of Milk Constituents on the Effectiveness of Vitamin D, J. Biol. Chem. **114**: 95 (May) 1936.
3. Ansbacher, S., and Supplee, G. C.: The Cholesterol Content and the Antirachitic Activation of Milk Constituents, J. Biol. Chem. **105**: 391 (May) 1934.

The foregoing results were explained by assuming that vitamin D in aqueous solution reacts chemically with the secondary valencies of purified lactalbumin to form a "symplex," a system containing vitamin D as a lipid prosthetic group attached to the carrier, lactalbumin. The antirachitic potency of vitamin D present in this form is thus greater under the conditions of the experiment than that of uncombined vitamin D. The failure of an increase in antirachitic activity of an oily solution of vitamin D was attributed to the fact that the oil in which the vitamin was dissolved itself combined with some of the secondary valencies of the lactalbumin or perhaps other proteins of the milk, thus preventing the combination with the vitamin and the subsequent augmentation of its antirachitic activity. Although it is difficult to reconcile the foregoing hypothesis with certain other observations in the literature, particularly with the determination that practically all of the antirachitic potency of irradiated milk resides in the cream portion,[4] the postulate that the peculiar effectiveness of vitamin D in milk is due in part at least to its combination and dispersion with lactalbumin merits further careful experimental study.

Current Comment

BLOOD PLATELETS AFTER SPLENECTOMY

One of the most striking and consistent hematologic changes that occur following the removal of the spleen is an increase in the number of platelets in the blood. This response has been observed both in normal persons in whom the spleen has been removed because of sudden rupture due to trauma and in splenectomized patients with certain diseases. Recently, further confirmatory data have been reported.[1] Splenectomy in three normal boys from 10 to 11 years of age was followed by thrombocytosis, the number of platelets increasing steadily to a maximum between the fifth and twelfth days, and decreasing slowly thereafter toward normal values. In one patient the platelet count increased from a normal level of 500,000 to a maximum of 1,640,000 on the twelfth day and then decreased, returning to the original value after some two months. Variations in the platelet counts of patients following splenectomy also were determined. Operation on twenty children with rheumatic disease was followed by an increase in the number of thrombocytes to values exceeding 1,000,000 in every case. As was found in the normal children, the peak of the rise occurred between the sixth and fourteenth days. A similar thrombocytosis was observed following operation in one case of splenomegaly of undetermined origin, in four cases of congenital hemolytic icterus and, with one exception, in eight cases of hemorrhagic thrombocytopenia. The results in the latter group are of particular interest because of the exceedingly low platelet counts found in these patients prior to splenectomy. No consistent postoperative rise in platelets was found, however, in eight patients with Cooley's anemia. The degree of the increase in platelets was never as pronounced or as long in duration as those observed in the other conditions. No significant changes in the platelet count were found in control subjects in whom operations other than splenectomy had been performed. These observations add further to the evidence that the spleen is intimately related to the number of thrombocytes circulating in the blood stream. The nature of the regulatory action, however, is not known. Some investigators[2] have suggested that the spleen may act as a "death house" for platelets or may inhibit their formation and, therefore, that the thrombocytosis following splenectomy may be a result of a decreased thrombolysis or a decreased inhibition of platelet formation or, perhaps, both.

FEAR IN CHILDREN

Fear in children, like pain, according to Weber[1] is a danger signal called into existence to draw to the individual's notice the presence of some threat to his welfare. In its normal form, therefore, it is supposed to have ultimately a protective purpose, with a direct relation to self preservation. As an emergency reaction, however, its continued existence is probably harmful. The condition of body and mind to which it gives rise is injurious to the total well being of the organism. In view of the absolute helplessness of the new-born infant, it is not surprising that at the outset of life fear plays little part. Since fear is a danger signal and hence implies some discrimination, this reaction is useless to the new-born infant, which is unable to discriminate. Rapidly, however, the infant is able to develop discrimination to some degree. Then fear becomes in many instances a powerful motivator of behavior. Within certain limits, anything that decreases the sense of security predisposes to fear. In this way a summation of factors may produce a state of terror. Fortunately for the child in whom this state has been produced, his powers of adaptation enable him to unlearn as well as to learn. Recognition of these fundamental facts is important from the point of view both of the physician and of the parent. It brings with it the realization that the child's fear is not cowardice or stupidity but is rather symptomatic of self preservation. A constructive view of such a situation and a more tolerant and understanding attitude of mind not only can lead to proper treatment of the fear but also strongly affects the relation between parent and child. The reaction is a specialized, not a universal, emergency reaction and some species of animals which lack this emotion have other means of defense at their disposal. The fact, however, that many animals also have this type of reaction suggests the possibility of deriving help from a comparative study. Thus many animals, as did primitive man, regard the unknown, often with justice, as a potent cause of fear. There is much reason to

4. Haman, R. H., and Steenbock, Harry: The Differential Antirachitic Activity of Vitamin D Milks, J. Nutrition **10**: 653 (Dec.) 1935.

1. Wollstein, Martha, and Kreidel, Katherine V.: Blood Picture After Splenectomy in Children, with Special Reference to Platelets, Am. J. Dis. Child. **51**: 765 (April) 1936.

2. Krumbhaar, E. B.: The Changes Produced in the Blood Picture by Removal of the Normal Mammalian Spleen, Am. J. M. Sc. **184**: 215 (Aug.) 1932.

1. Weber, Hilda: An Approach to the Problem of Fear in Children, J. Ment. Sc. **82**: 136 (March) 1936.

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believe that some of the fears of childhood represent an atavistic survival of this primitive dread. In any case, incorrect treatment of the fears of childhood often lays the foundation for much unhappiness and even illness in later life. A more satisfactory appreciation of the emotion opens the way to a more wisely tolerant and perceptive view of the frightened child's difficulties. Hence frequently childish doubts and dreads, which if neglected or mismanaged might be dangerous, become the starting point for intelligent management and real progress. Fears wisely dealt with early in life may in fact become a stimulus toward healthy mental development.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

ALABAMA

Outbreak of Poliomyelitis.—Churches were closed in many north Alabama communities, July 12, as a precaution against the spread of an outbreak of infantile paralysis which has caused eight deaths, according to the Chicago *Tribune*. The number of cases was said to be 126, most of them confined to the upstate Tennessee valley counties and those adjoining.

ARKANSAS

Society News.—The Washington County Medical Society was addressed, June 2, by Drs. Arthur F. Hoge, Fort Smith, on "Surgery in Diabetes," and Leroy Long, Oklahoma City, "Prevention of Postoperative Intestinal Incompetence."——At a meeting of the Mississippi County Medical Society, June 2, Dr. Charles E. Wilson, Blytheville, spoke on "Mitral Insufficiency" and Dr. Thomas F. Hudson, Luxora, "Aortic Regurgitation."——Speakers before the Fifth Councilor District Medical Society in Magnolia, May 26, were Drs. George V. Lewis on "Ruptured Appendix"; Silas C. Fulmer, "Treatment of Heart Disease," and Paul L. Mahoney, "Bronchoscopy"; all are of Little Rock.——Drs. Lorenzo T. Evans, Batesville, and Paul H. Jeffery, Bethesda, discussed diabetes before the Independence County Medical Society at Batesville, June 8, and Dr. John J. Monfort, Batesville, "Anesthesia with Special Reference to Spinal Anesthesia."——Drs. George B. Fletcher and William T. Wootton, both of Hot Springs National Park, read papers before the Southeast Arkansas Medical Society at McGee, June 15, entitled "Under Water Treatment of Certain Types of Paralysis" and "Is There a Rheumatic Heart?" respectively. ——The Eighth Councilor District Medical Society was addressed in Petit Jean State Park, Morrilton, recently, among others, by Dr. Augustus C. Shipp, Little Rock, on "Surgical Treatment of Tuberculosis."

CALIFORNIA

Dr. Porter Becomes Emeritus Professor.—Dr. Langley Porter, who has retired as dean of the University of California Medical School, San Francisco, will continue his affiliation with the school "in an emeritus position as an adviser in administration and research," according to the San Francisco *Chronicle*. For three years before he became dean and professor of medicine in 1927, Dr. Porter was in Rome, studying chiefly scarlet fever and translating works on that subject. Dr. Porter is 66 years old. He has been associated with the University of California since 1918.

Personal.—Dr. John C. Decker, Portola, has been appointed health officer of Plumas County, succeeding Dr. Wilbur C. Batson, Greenville.——Dr. William Dock, associate professor of medicine, Stanford University School of Medicine, San Francisco, has been appointed secretary of the San Francisco Heart Committee to succeed Dr. Amos Christie, who has resigned to engage in a two year study at Johns Hopkins University Hospital for the U. S. Children's Bureau.——Dr. Richard D. Husband has been appointed superintendent of Stanislaus County Hospital, Modesto, succeeding the late Mr. Jay A. Rydberg.

CONNECTICUT

Society News.—At a meeting of the Litchfield County Public Health Association in Canaan, June 1, Dr. Stanley H. Osborn, Hartford, state health commissioner, discussed "Physicians and the Social Security Act," and Dr. Millard Knowlton, Hartford, "Streptococcus Sore Throat and Scarlet Fever." ——At a recent meeting of the Yale Medical Society in New Haven, papers were presented by Dr. Robert M. Lewis on "Estrin in the Treatment of Gonorrheal Vaginitis"; Daniel Melnick, Ph.B., "Effect of Diet on the Regeneration of Serum Protein"; Dr. Harry M. Zimmerman, George R. Cowgill, Ph.D., James C. Fox Jr. and Marion E. Howard, "Vitamin B_2 Deficiency in Dogs," and Dr. Henry G. Barbour, Jane Trace, B.A., and Paul K. Smith, Ph.D., "Observations on the Effects and Fate of Heavy Water in Mice."

DISTRICT OF COLUMBIA

Society News.—Merle A. Tuve, Ph.D., Carnegie Institution, department of terrestrial magnetism; Lyman J. Briggs, Ph.D., and Lauriston S. Taylor, A.B., U. S. Bureau of Standards; Dr. George W. McCoy, National Institute of Health; Dr. Edwin A. Merritt and Dr. William J. Mallory, professor of medicine, George Washington University School of Medicine, presented the scientific program of the meeting, June 9, of the Academy of Medicine of Washington, D. C., which was organized April 28 (THE JOURNAL, June 6, p. 2011). The subject of discussion was "High Energy Particles and Radiations."

FLORIDA

New Bureau of Maternal and Child Health.—The establishment of a bureau of maternal and child health in the Florida State Department of Health, Jacksonville, has been announced. Dr. Emile Bryant Woods, assistant professor of obstetrics and gynecology, University of Georgia School of Medicine, Augusta, has been named director. The new bureau will act in an advisory capacity to city, county and district health departments and will sponsor a statewide educational program. It was made possible through funds provided under the Social Security Act.

GEORGIA

Health Officer Honored.—Dr. Millard E. Winchester, Brunswick, health officer of Glynn County, was presented in superior court, June 29, with a set of resolutions passed by the grand jury acknowledging his service and that of his staff in achieving national recognition for the county board of health in the contest sponsored by the U. S. Chamber of Commerce and the American Public Health Association.

ILLINOIS

Rabies.—A quarantine was placed on dogs in Elmhurst and Naperville early in June, when the deaths of one child and several head of cattle from rabies were reported.

Fifty Years of Medicine.—Five members who had completed fifty years in the practice of medicine were honored by the Hancock County Medical Society at a dinner meeting in Carthage, July 6. The guests of honor were Drs. Charles L. Ferris, Carthage, who graduated in 1878; Charles A. Runyon, Elvaston, 1884; John A. Miller, Hamilton, 1881; Thomas J. McDaniel, Plymouth, 1886, and John R. Bryant, West Point, 1885. The program included a sound motion picture on "Forceps Delivery," lent by Dr. Joseph B. De Lee, and a motion picture on the heart, shown by Dr. Clayton J. Lundy, Chicago. Speakers included Drs. Leroy H. Sloan and George De Tarnowsky, both of Chicago.

Society News.—Dr. Ernest E. Davis, Avon, addressed the Jo Daviess County Medical Society in Stockton, June 20, on eclampsia, and Dr. George C. McGinnis, Warren, on injection treatment of varicose veins.——Dr. Abraham A. Low, Chicago, conducted a clinic before a joint meeting of the Union County Medical Society and the staff of the Anna State Hospital, Anna, May 14, on mental cases of interest to the general practitioner.——The Whiteside County Medical Society was addressed at Prophetstown, June 25, by Dr. M. Herbert Barker, Chicago, on "Treatment of Hypertension with Special Reference to the Cyanates."——Dr. George D. Hauberg, Moline, was named president of the Iowa and Illinois Central District Medical Association at the annual meeting in Davenport, Iowa, in May. Dr. Elmer G. Senty, Davenport, is vice president; Dr. James Dunn, Davenport, secretary, and Dr. Florens E. Bollaert, East Moline, treasurer. The next meeting will be held October 28 at the LeClaire Hotel in Moline.

Chicago

University News.—Mr. John Bellamy Taylor of the General Electric Company addressed the recent annual meeting of Sigma Xi, University of Illinois College of Medicine, on "The Electric Eye and the Human Eye."

Hospital News.—A new medical library was dedicated at Ravenswood Hospital, June 24; it is believed to be the first at any hospital in the United States to combine clinical records with the regular medical collection. Dr. Malcolm T. MacEachern was the principal speaker.

Dr. Christian to Give Billings Lecture.—The third Frank Billings Lecture of the Thomas Lewis Gilmer Foundation will be delivered by Dr. Henry A. Christian, Hersey professor of theory and practice of physic, Harvard University Medical School and the graduate school, October 26, at a joint meeting of the Institute of Medicine of Chicago and the Chicago Society of Internal Medicine. The topic will be "Edema, Diuretics, Diuresis."

Compulsory Automobile Inspection.—Free inspection of automobiles, compulsory on all owners of cars since July 1, is expected to reduce accidents by eliminating mechanical defects, and to lessen noise in the city. Every car registered in Chicago will be required to have an inspection twice a year. A city wide rally, as a prelude to the inauguration of compulsory inspection, was held in Grant Park, June 30, under the auspices of the Keep Chicago Safe Committee and the Chicago park district.

IOWA

New Officers Honored.—Dr. Edward M. Myers, Boone, president-elect of the Iowa State Medical Society, and Dr. Earl B. Bush, Ames, newly elected councilor of the fifth district, were guests of honor at the annual joint summer meeting of the Boone and Story county medical societies at the Boone Country Club, June 24. Speakers included Drs. Walter H. Nadler, Chicago, on "Diagnosis and Treatment of Chronic Cholecystitis from a Medical Standpoint," and Waltman Walters, Rochester, Minn., "Surgical Aspects of Lesions of the Biliary Tract with Particular Reference to the Cholecystectomy Syndrome." Music was furnished by Drs. Myers, Henry W. Bowers, Nevada, and Robert S. Shane, Pilot Mound.

Society News.—At a meeting of the Cerro Gordo County Medical Society in Mason City, May 5, speakers included Drs. Bert E. Hempstead, Rochester, Minn., "Suppuration of the Petrous Portion of the Temporal Bone," and Channing E. Dakin, Mason City, "Shock."——The Clinton County Medical Society was addressed in Clinton, May 7, by Drs. James Stuart McQuiston and Morgan J. Foster, both of Cedar Rapids, on "Common Neurologic Conditions" and "Intracranial Birth Injuries."——Dr. Sterling J. Ritchey, Colfax, addressed the Jasper County Medical Society in Newton, May 5, on endometriosis.——At a meeting of the Lyon County Medical Society in Rock Rapids, June 12, Dr. James W. Graham, Sioux City, gave an illustrated lecture on "Scoliosis and Treatment of Fractures of the Spine."——Dr. William J. McGrath, Elkader, has been elected president of the Austin-Flint Cedar Valley Medical Society.——Dr. Edward B. Hoeven, Ottumwa, secretary-treasurer for five years of the Des Moines Valley Medical Society, was chosen president at the recent annual meeting. Dr. Elias B. Howell, Ottumwa, a former president and secretary of the society, was again elected secretary.——Dr. Thomas L. Vineyard, Dow City, was chosen president of the Twin Lakes District Medical Society at its meeting in Rockwell City, June 11.

KANSAS

Graduate Course on Pediatrics and Obstetrics.—Graduate work will be offered to physicians throughout the state under a program to be financed with social security funds, the Kansas Medical Society announces. A course on pediatrics and obstetrics, the first of a series, was presented from June 22 to July 18. The lecturers are Drs. Everett D. Plass, professor of obstetrics and gynecology, State University of Iowa College of Medicine, Iowa City, and Frank C. Neff, professor of pediatrics, University of Kansas School of Medicine. The course is being conducted in Dodge City, Ness City, Norton, Goodland, Garden City and Liberal.

KENTUCKY

Society News.—At a meeting of the Fifth District Medical Association in Carrollton, papers were presented by Drs. William E. Gardner, Louisville, on "Advantageous Neurotic Reactions"; Allen Donaldson, Carrollton, "Radiation in Regard to General Practice"; Wallace Frank, Louisville, "Cancer of the Breast," and Winston U. Rutledge, Louisville, "Diagnosis and Treatment of Skin Diseases."

LOUISIANA

Personal.—Dr. Lloyd A. Masterson, Opelousas, for two years director of the St. Landry Parish Health Unit, has been promoted to director of the bureau of maternity and infant hygiene of the state board of health. Dr. Franklin V. Boyd, Lake Providence, succeeds Dr. Masterson as health officer.

MAINE

Campaign Against Cancer.—A state committee has been formed to carry on a campaign against cancer which was recently launched under the auspices of the American Society for the Control of Cancer, the state board of health and the Maine Medical Association. The committee, of which Dr. Magnus F. Ridlon, Bangor, is chairman, will provide free services of a pathologist, a radiologist, a roentgenologist and a surgeon. The advisory and executive committee includes Dr. Joseph W. Scannell, Lewiston, chairman; Dr. John Johnson, Bangor; Dr. Edward H. Risley, Waterville; Dr. William Holt, Portland; Dr. George H. Coombs, Augusta; Mrs. Ridlon, Bangor; Mrs. Holt, Portland; Dr. George G. Averill, Waterville, and Bishop J. E. McCarthy, Portland. A woman's "field army" against cancer has been organized with Mrs. Holt as state commander; vice commanders are Mrs. B. G. Cushman, Lewiston, and Mrs. Ridlon. Clinics have been established at Lewiston, Waterville and Portland.

MARYLAND

Personal.—Dr. William J. French, formerly of Ellicott City, since 1932 health director of Howard County, has been appointed to a similar position with Anne Arundel County, succeeding Dr. John H. Janney Jr., Annapolis.

Conference of Health Officers.—The annual conference of city and county health officers and boards of health of Maryland was held in Baltimore, May 8, under the direction of the state board of health. Speakers included:

Dr. Thomas Parran Jr., surgeon general, U. S. Public Health Service, Washington, D. C., Social Security Act in Its Relation to Public Health.
Dr. Clifford E. Waller, U. S. Public Health Service, Present Status of Treatment of Pneumonia.
Dr. Lloyd D. Felton, Baltimore, Recent Incidence of Epidemic Meningitis.
Dr. Albert S. McCown, Washington, Maternal and Child Health in Relation to the Social Security Act.

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MASSACHUSETTS

Hospital News.—During 1935 the Boston Dispensary recorded 130,578 visits to its morning clinics, 68.8 per cent of which were free. In the evening pay clinics for working people of small means, 27,372 visits were recorded, 13.6 per cent of which were free. The diagnostic hospital for clinic and private patients reported 4,797 days' care, 74.6 per cent of which was free, while physicians' visits to homes, free to those unable to pay, totaled 31,527.

Mental Hygiene Survey.—The Massachusetts Society of Mental Hygiene recently completed a survey of Springfield to determine the need for better mental hygiene facilities for the city and its suburbs. More than thirty agencies were studied in addition to the school department and the local divisions of state agencies. A report of the survey states that one of the most pressing needs is the training of staff personnel in mental hygiene to enable them better to detect personality and conduct disorders. It recommends that psychiatrically trained personnel be included in the staff organization. It recommends further that provision be made for additional clinical service for the public school system. The report states that the present child guidance clinic at the Springfield Hospital, now operating on a part time basis, should be placed on a full time schedule to give service to both adults and children, and, in addition, extend its activities in the district court to include therapy to selected persons at the clinic. The need for continued education of the public is emphasized.

MICHIGAN

Hospital News.—The second annual convention of the Intern Alumni Association of Providence Hospital, Detroit, was held at the hospital, June 10-11. Speakers included Drs. Francis D. Murphy, Milwaukee, on "Significance of Benign and Malignant Hypertension"; Max M. Peet, Ann Arbor, "Hypertension and Treatment," and Waltman Walters, Rochester, Minn., "Gastric Surgery." Frank Cody, superintendent of Detroit public schools, gave the banquet address.

Commission on Welfare and Relief.—Governor Frank D. Fitzgerald recently appointed a special commission on welfare and relief, composed of nineteen members. Physicians on the commission include Drs. Charles D. Pullen, Mount Pleasant, Donald M. Morrill, Grand Rapids, and Stanley W. Insley, Detroit, who is the representative of the Michigan State Medical Society. At a meeting with representatives of the state medical society in March, the governor proposed the organization of this commission to outline legislation designed to revamp and coordinate all state relief agencies (THE JOURNAL, May 2, p. 1576).

Grant for Research in Pneumonia Control.—The Commonwealth Fund of New York has approved an annual grant of $16,800 to the Michigan State Department of Health, Lansing, to promote study of antipneumococcic serum production. The fund's grant will be supplemented by an annual state appropriation of $10,000. The objective of the study is to improve the antipneumococcic serum and to reduce the cost so as to make it available to the person of ordinary means. It will continue three years or longer, if sufficient progress is shown. Five persons will be added to the laboratory staff of the department, and $2,000 will be available for the purchase of animals. Last year the death rate from pneumonia in Michigan was the highest since 1929.

MINNESOTA

Thirty-Three Years on Health Board.—Dr. James F. Lynn resigned as president of the board of health of Waseca, April 14. He was first elected in 1901 and served continuously until the day he resigned, except for the years 1918, when he was in the World War, and 1910, when Dr. Alexander J. Rudolf, now of Milwaukee, held the position. Dr. Lynn graduated from the University College of Medicine, Richmond, in 1896; he is 65 years of age.

Regional Training Center.—The University of Minnesota School of Medicine, Minneapolis, has been selected as one of the regional training centers in public health to be subsidized in part by the U. S. Public Health Service out of funds appropriated by the Social Security Act. An introductory course will begin September 28, to continue for three months. The first introductory course was attended by fifty-seven persons. The program is a cooperative one between the university and the state department of health with the added assistance of the local health departments and health agencies of the state. Dr. Harold S. Diehl, dean of the medical school, announces that graduate work on an individual basis may be undertaken at any time.

MISSISSIPPI

Personal.—Dr. Jesse E. Brumfield, Tylertown, has been appointed head of the State Colony for the Feebleminded at Ellisville, succeeding Dr. Romeo R. Halfacre.

Conferences of Local and County Registrars.—The second annual conference of the county and district registrars was held at New Albany, May 28. Dr. John Collinson Jr., assistant chief statistician of vital statistics for the bureau of census, Washington, D. C., attended the meeting. Similar conferences were held at Laurel June 2 and Cleveland June 5.

MISSOURI

Refresher Courses.—The Missouri State Board of Health will conduct refresher courses in obstetrics and pediatrics beginning this month. A portion of the funds available for maternal and child welfare work under the social security act has been set aside to make these courses available to physicians in rural areas without enrolment or tuition. Dr. Paul F. Fletcher, St. Louis, has been named to conduct the obstetric courses and Dr. Oscar F. Bradford, Kansas City, the pediatric courses. Motion pictures and lantern slides will be used with most of the lectures, followed by informal discussions. Clinical demonstrations will also be held whenever possible. The state has been divided into six districts, each lecture district comprising the counties in about five councilor districts. Each course will consist of eight lectures, one each week in a councilor district on the same day of each week, permitting the lecturer to give the same lecture in five councilor districts each week until the course is complete. The first course in obstetrics will be inaugurated in lecture district D, while the first course in pediatrics will begin in district A. It is expected to devote a full year to presenting these two courses to all counties in the rural areas.

Dr. Leo Loeb to Retire.—Dr. Leo Loeb, Edward Mallinckrodt professor of pathology, Washington University School of Medicine, St. Louis, has announced his retirement to be effective at the end of this year, newspapers report. Dr. Loeb, who is 66 years of age, graduated from the University of Zurich Faculty of Medicine in 1898. He has served at McGill University, the University of Illinois, New York State Pathological Laboratory, Buffalo, and the University of Pennsylvania. He was director of the department of pathology of the Barnard Skin and Cancer Hospital, St. Louis, from 1910 to 1915, serving as professor of comparative pathology at Washington from 1915 to 1924. In the latter year he became professor of pathology. From 1910 to 1912 he was chairman of the Section on Pathology and Physiology of the American Medical Association. He is a member of many scientific societies and was president of the American Association of Pathologists in 1914 and the Society of Cancer Research in 1911. Dr. Loeb's research has included, among other subjects, tissue and tumor growth, physiology of generative organs, pathology of circulation, venom of Heloderma, and analysis of experimental amebocyte tissue. The Mu chapter of the Phi Beta Pi Medical Fraternity established a lectureship in his honor early this year. The first lecture was delivered by Dr. Walter B. Cannon, George Higginson professor of physiology, Harvard Medical School, Boston. In 1935 Dr. Loeb was awarded the John Phillips Memorial Medal by the American College of Physicians.

NEBRASKA

Personal.—Dr. Edward R. Stewart, Blair, was honored at a meeting of the Burt, Washington and Dodge Counties Medical Society, Tekamah, May 26, for his completion of fifty years of medical practice.——Dr. and Mrs. Carroll D. Evans Sr., Columbus, celebrated their golden wedding anniversary May 27.——Dr. Frederick J. Schwertley, Omaha, was recently graduated from the Creighton Law School.——Dr. Floyd H. Kinyoun was recently appointed health officer of Omaha to succeed Dr. Millard Langfeld.——The Wahoo Chamber of Commerce sponsored a dinner June 18 in honor of Drs. Charles F. Kirkpatrick, Ashland, and Andrew E. Stuart, Cedar Bluffs, who have practiced fifty years in Saunders County. Drs. George W. Covey, Lincoln, and Donald J. Wilson, Omaha, and Mr. H. E. Kokjer, Wahoo, were speakers.

Society News.—Speakers who addressed the Madison-Six County Medical Society at a meeting in Wausa, May 26, were Drs. Joseph E. Dvorak, on "Eye Changes in General Disease"; Ronald F. Martin, "Therapy in the Toxemias of Pregnancy," and Archibald F. O'Donoghue, "Injuries to the Spine." All are of Sioux City, Iowa.——Dr. John C. Thompson, Lincoln, addressed the Southwestern Nebraska Medical Society, May 24, at Indianola on anemia.——A symposium on fever therapy was presented before the Sixth Councilor District Medical Society, York, May 25, by Drs. Abram E. Bennett, Eugene E. Simmons and Charles A. Owens Jr., all of Omaha.——At a meeting of the Tenth Councilor District Medical Society, Ingleside, May 28, speakers were Drs. Adolph Sachs, Omaha, on "Diabetes"; George W. Covey, Lincoln, "Coronary Occlusion: Some New Thoughts on Restoration of Blood Supply to the Infarcted Heart," and Philip H. Bartholomew, Lincoln, "Public Health Work and the Maternal and Child Health Program in Nebraska."

NEW JERSEY

Dr. Shope Receives Award.—Dr. Richard E. Shope of the staff of the Princeton laboratory of the Rockefeller Institute for Medical Research received a prize of $1,000 awarded by Sigma Xi on the occasion of its semicentennial in June. An observance of the anniversary was held at Cornell University, Ithaca, N. Y., where the scientific honor society was founded, during the annual meeting of the American Association for the Advancement of Science. Dr. Shope is a native of Iowa and a graduate of the State University of Iowa College of Medicine, class of 1924. He joined the Rockefeller Institute in 1925. The Sigma Xi award was in recognition of Dr. Shope's work on swine influenza.

NEW YORK

Hospital News.—The White Plains Hospital, White Plains, has recently opened a new service for treatment of cancer in affiliation with Memorial Hospital, New York. A tumor clinic will be established under supervision of Memorial Hospital, the staff of which is to act in an advisory and consultant capacity.

Personal.—A portrait of Dr. Augustus B. Wadsworth, Albany, director of the division of laboratories and research of the state department of health, was presented to the division June 3 by the laboratory staff and members of the New York State Association of Public Health Laboratories. The portrait

was painted by Leopold Seyffert, New York.——Dr. Dayton L. Kathan, Schenectady, was guest of honor at the semiannual meeting of the Schenectady County Medical Society, June 4, in compliment to his completion of fifty years of practice.

Appointments to State Health Department.—Dr. Wildridge C. Thompson Jr., who recently received the certificate in public health at Johns Hopkins University, has been appointed full time medical consultant in social hygiene in the New York State Department of Health. Dr. Helen H. Owen, Albany, has been provisionally appointed assistant director of the division of maternity, infancy and child hygiene; she was formerly on the staff of the division of laboratories and research. Dr. Frank W. Laidlaw, Middletown, formerly a district state health officer, has been provisionally made district health director.

Society News.—Dr. Carl E. Badgley, Ann Arbor, Mich., addressed the Niagara County Medical Society, Niagara Falls, June 9, on "Common Fractures Met in General Practice."——Dr. Ellery G. Allen, Syracuse, addressed the quarterly meeting of the Ontario County Medical Society, in Geneva, July 14, on "Recent Advances in Hematology."——Dr. Orren D. Chapman, Syracuse, was elected president of the New York State Association of Public Health Laboratories at the annual meeting in May, and Mary B. Kirkbride, Sc.D., Albany, reelected secretary.——Dr. Richard W. Weiser, Kenmore, was elected president of the New York State Association of School Physicians at the annual meeting in Saratoga Springs, June 22-23.——Dr. Floyd Burrows, Syracuse, addressed the Medical Society of the County of Montgomery at its semiannual meeting in Amsterdam in June on collection methods.

New York City

Hospital News.—Dr. Leon Asher, professor of physiology, University of Berne, Switzerland, gave a lecture at Mount Sinai Hospital, June 11, on "The Thyroid Gland and the Central Nervous System."——Natale Colosi, Ph.D., has been appointed general director of the Parkway Hospital.

Memorial Playground.—A playground on Seventeenth Street west of Eighth Avenue, known as the Model Playground, was recently dedicated and renamed the Dr. Gertrude B. Kelly Playground in memory of Dr. Kelly, who died in 1934. Mayor La Guardia spoke and a plaque commemorating Dr. Kelly was unveiled by Miss Dorothea Marty, a nurse from the New York Infirmary for Women and Children, with which Dr. Kelly was associated for many years.

Gifts to Columbia.—The following gifts to Columbia University for medical purposes were recently announced:

The John and Mary R. Markle Foundation, $5,000 for research in brain tumors in the department of neurology.
The Chemical Foundation, $2,500 to establish a fund for research in brain chemistry.
Trustees of the Anna Fuller Fund, $1,500 for special research in the Institute of Cancer Research.
Mrs. M. Maxim Steinbach, $300 for the Friedman Tuberculosis Fund in the department of bacteriology.
National Tuberculosis Association, $260 for research in tuberculosis.

Report of Library.—The library of the Medical Society of the County of Kings reports that in 1935 15,957 readers consulted 67,909 books in the library and took out 13,099 for home use. The first figure was an increase of 12.6 per cent over 1934, the second 9.03 per cent and the third 23.3 per cent. The library added 778 books to its shelves during the year by purchase and gifts. It has on file 1,524 serial publications, 882 in English and 642 in twenty-five other languages. Dr. Jaques C. Rushmore is directing librarian and Mr. Charles Frankenberger librarian.

Advisers on Hospital Service.—The board of directors of the Associated Hospital Service of New York has appointed a group of physicians representing various branches of medicine to serve in an advisory capacity, especially regarding the eligibility of subscribers to services under the hospital plan. They are Drs. Conrad Berens for ophthalmology; George W. Kosmak, obstetrics; Adolph G. G. de Sanctis, pediatrics; Matthew Shapiro, internal medicine; Clarence G. Bandler, urology; George A. Blakeslee, neurology; Samuel J. Kopetzky, otolaryngology; Edward J. Davin, gynecology; William Hadden Irish, orthopedics; Rupert Franklin Carter, surgery; Abernethy Benson Cannon, dermatology, and William H. Stewart, radiology.

OHIO

Campaign on Diabetes.—The Public Health Federation of Cincinnati has recently formed a special committee on diabetes in cooperation with the Academy of Medicine of Cincinnati, with Dr. Cecil Striker as chairman. The committee plans to establish an information bureau for physicians and the public, to make a study of the morbidity and mortality of diabetes, and to carry on public health education emphasizing early discovery, annual physical examination, adherence to diet and development of a more receptive attitude toward use of insulin.

Dinner to Dr. Upham.—The Columbus Academy of Medicine sponsored a dinner in honor of Dr. John H. J. Upham, Columbus, President-Elect of the American Medical Association, June 5, at the Deshler-Wallick Hotel. More than 200 members of the academy and physicians from other parts of the state attended. Dr. Joseph M. Dunn presided and Dr. Leslie L. Bigelow was toastmaster. Speakers were: Drs. Herbert M. Platter, secretary of the Ohio State Medical Board, on "Dr. Upham and the State Medical Board"; Edwin A. Hamilton, "Dr. Upham and the College of Medicine"; Benjamin R. McClellan, Xenia, "Dr. Upham and the American Medical Association. George V. Sheridan and Don K. Martin, former secretaries, and Charles S. Nelson, present secretary of the Ohio State Medical Association, spoke on "Dr. Upham and the State Medical Association."

Society News.—At a meeting of the Adams County Medical Society, West Union, June 17, speakers were Drs. George W. Chabot, Peebles, on pneumonia; Robert Y. Littleton, Stout, fractures in country practice, and Joseph S. Rardin, Portsmouth, cesarean section.——Dr. Howard L. Stitt, Cincinnati, addressed the Fayette County Medical Society, Washington Court House, June 4, on "Effect of Diet on Disease of the Nose, Throat and Respiratory Tract."——Dr. John E. Greiwe, Cincinnati, addressed the Warren County Medical Society, Lebanon, June 2, on "The Electrocardiogram and the Coronary Circulation."——Dr. Carl D. Hoy, Columbus, discussed treatment of fractures at a meeting of the Muskingum County Academy of Medicine, Zanesville, June 3.——Dr. Hugo Roesler, Philadelphia, addressed the Columbus Academy of Medicine, June 1, on "Roentgenologic Considerations of Anatomy and Physiology of the Heart" and "Heart Disease, (*a*) Diagnostic Value of Inspecting and Palpating the Chest Wall; (*b*) Recent Progress in Drug Therapy."——Dr. Charles F. Bowen, Columbus, addressed the Morrow County Medical Society, Mount Gilead, June 9, on treatment of cancer.——The Carroll County Medical Society was recently reorganized after having been inactive since 1911. Carroll county physicians have been affiliated with the Stark County Medical Society. Drs. Charles R. Ziegler and Carl A. Lincke, Carrollton, are president and secretary, respectively.

PENNSYLVANIA

Society News.—The Seventh Councilor District of the Medical Society of the State of Pennsylvania held a meeting at the Williamsport Country Club, July 10, with the following speakers: Drs. Alexander H. Colwell, Pittsburgh, "Cardiovascular Emergencies in General Practice"; Walter F. Donaldson, Pittsburgh, "State Medical Society Problems"; James S. Taylor, Altoona, "Obstetrical Hazards," and John O. Bower, Philadelphia, "Appendicitis." Testimonials were presented to Drs. William H. Follmer, Williamsport, and James W. Ritter, Jersey Shore, both of whom have practiced more than fifty years.——The Fayette County medical and dental societies held their annual joint picnic at the Uniontown Country Club, July 8.——Dr. Nathaniel W. Winkelman, Philadelphia, addressed the Lehigh County Medical Society, Allentown, in June, on "Common Neurologic Conditions Met by the General Practitioner."——The Tri-County Medical Association (Dauphin, Lancaster and Lebanon counties) held a dinner meeting, June 25, at the Harrisburg Country Club, with Reed Carty, editor of the Danville *Times*, as guest speaker. A golf tournament preceded the dinner.

Philadelphia

Wistar Institute to Study Nutrition.—Plans for establishment of a department of nutrition were recently announced by the Wistar Institute of Anatomy. The new department will devote special study to the food problem not only in animals but also in mankind. One branch will be at the institute and another at the Effingham B. Morris Biological Farm near Bristol.

TENNESSEE

Society News.—Drs. Eugene Lee Myers and William E. Jost, St. Louis, addressed the Tri-County Medical Society (Carroll, Henry and Weakley counties), June 9, on "A Plea for More Frequent Use of the Bronchoscope in Medical and Surgical Practice" and "Cystoscopic Interpretation of Bladder Diseases" respectively.——Speakers at a meeting of the Dyer, Lake and Crockett Counties Medical Society at Reelfoot Lake, June 3, were Drs. William C. Dixon, Nashville, on "Cancer

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of the Cervix"; Robert Lyle Motley, Memphis, "Treatment of Coronary Thrombosis and Angina Pectoris," and Harrison H. Shoulders, Nashville, "Diagnosis of Acute Abdominal Conditions."——Dr. Jefferson C. Pennington, Nashville, was elected president of the Middle Tennessee Medical Association at its semiannual meeting in Shelbyville, May 21-22.

TEXAS

Society News.—The medical societies of Hopkins and Franklin counties recently merged, with Dr. Earl Stirling, Sulphur Springs, as president, and Dr. Zack C. Fuquay, Mount Vernon, secretary.——Drs. Frank H. Newton and Edwin L. Rippy, Dallas, addressed the Dallas County Medical Society, June 25, on "Injuries to the Eyes" and "Physical Constitutional Types and Their Relationship to Disease" respectively.

WEST VIRGINIA

Personal.—Dr. William T. Booher Jr., Wellsburg, has been appointed health officer of Brooke County to succeed Dr. Leonard J. Bernstein, who resigned.——Dr. George M. Caldwell, Fairfield, Ala., a 1935 graduate of the University of Virginia Medical Department, has been appointed assistant medical director at the Greenbrier, White Sulphur Springs.

Refresher Courses.—A series of graduate courses on pediatrics and child hygiene presented through cooperation of the maternal and child welfare committee of the West Virginia State Medical Association and the state health department was begun June 29 in Romney. Other towns scheduled for this series are Lewisburg, Parkersburg, Wheeling, Elkins, Morgantown, Fairmont and Clarksburg. The course is conducted by Dr. George M. Lyon, Huntington, and lasts five days. It is financed by federal funds.

WISCONSIN

Hospital News.—The first Dr. Harry A. Sifton Memorial Lecture was given at the Milwaukee Hospital, May 21, by Dr. William S. Middleton, dean, University of Wisconsin Medical School, Madison, on "The Tools with Which We Work."

Personal.—Dr. Albert C. Edwards, Sheboygan, has been appointed epidemiologist for the state board of health.——Dr. William H. Washburn, professor of medicine, emeritus, Marquette University School of Medicine, Milwaukee, recently received a life membership in the Maternity Hospital and Dispensary Association of Milwaukee, as a tribute to "his unfailing service and devotion to humanity."

GENERAL

Exhibit at Science Meeting.—The American Association for the Advancement of Science announces that applications are being received for its annual science exhibition in connection with the winter meeting at Atlantic City, December 28-January 1. Information concerning the exhibit may be obtained from Fay C. Brown, Ph.D., Smithsonian Institution, Washington, D. C.

Rocky Mountain Medical Conference.—Plans for a conference in Denver in 1937 of the medical societies of the Rocky Mountain states, Colorado, New Mexico, Utah, Montana and Wyoming, have been proposed by the Colorado Medical Society. The plan, which provides that a joint meeting be held every three years with a different state acting as host, was endorsed at the recent state meetings of the Colorado and New Mexico state medical societies.

Guggenheim Foundation Increased.—Former Senator and Mrs. Simon Guggenheim, New York, have recently added more than a million dollars to the endowment of the John Simon Guggenheim Foundation, founded in 1925 in memory of their son to provide means for men and women of high ability to further their work. In the eleven years of its existence the foundation has made grants to 525 persons, among whom were fifty-three working in the field of biology, including medicine.

Births and Deaths of Negroes.—The U. S. Department of Commerce has compiled births and deaths of Negroes in the United States for 1934, showing 257,106 births and 182,075 deaths. Georgia had the largest number of births, 26,314, as well as of deaths, 16,475. The next largest numbers of births were in Mississippi, 25,478; North Carolina, 24,516; Alabama, 23,937, and South Carolina, 22,415. The same states in different order had the highest numbers of deaths: Alabama, 13,209; North Carolina, 12,847; Mississippi, 12,390, and South Carolina, 11,809. Vermont reported only one Negro death; South Dakota, seven. Vermont and Idaho reported three births each; South Dakota, two. Heart disease was the leading cause of death, with 27,586 fatalities. Other important causes were tuberculosis, 17,713; pneumonia, 15,999; nephritis, 14,822; cerebral hemorrhage and softening, 11,369. Cancer caused 7,849 deaths.

Society News.—Dr. Carl W. Maynard, Pueblo, Colo., was chosen president-elect of the American Society of Clinical Pathologists at its annual meeting May 10, and Dr. Roy R. Kracke, Emory University, Ga., was installed as president. Dr. Frederick C. Narr, Kansas City, was made vice president, and Dr. Alfred S. Giordano, South Bend, Ind., was named secretary to serve from 1936 to 1939.——Dr. Joseph C. Beck, Chicago, was elected president of the American Bronchoscopic Society at its annual session, May 27, succeeding Dr. Hermon Marshall Taylor, Jacksonville, Fla. Dr. Lyman G. Richards, Boston, was reelected secretary.——Dr. Edward H. Skinner, Kansas City, was chosen president-elect of the American Radium Society at its annual meeting in Kansas City in May. Vice presidents elected were Drs. Charles L. Martin, Dallas, Texas, and Orville N. Meland, Los Angeles, and Dr. William P. Healy, New York, secretary. At the annual banquet Dr. Curtis F. Burnam, Baltimore, delivered the Janeway Lecture on "Early Experiences with Radium."——The Seaboard Medical Association of Virginia and North Carolina and of the Virginia Pharmaceutical Association took a cruise to Bermuda June 14-19 on the liner *Reliance*. The program consisted of graduate lectures by Drs. William B. Porter, Richmond, medicine; Hubert A. Royster, Raleigh, N. C., surgery; Alfred R. Shands Jr., Durham, N. C., orthopedics; Gabriel Tucker, Philadelphia, otolaryngology; Julian M. Ruffin, Durham, gastro-enterology; Claude C. Coleman, Richmond, neurology; Robert A. Ross, Durham, obstetrics and gynecology, and James B. Sidbury, Wilmington, N. C., pediatrics.——The Southern Society of Clinical Surgeons held its annual meeting in New York, June 4-5, programs being presented at Presbyterian and New York hospitals. Dr. John M. T. Finney Jr., Baltimore, was elected president, Dr. Isaac A. Bigger, Richmond, vice president, and Dr. William Perrin Nicolson Jr., Atlanta, secretary. The 1937 meeting will be held in Ann Arbor, Mich.

CANADA

Dr. Gallie Appointed Dean at Toronto.—Dr. William E. Gallie, professor of surgery at the University of Toronto Faculty of Medicine, has been appointed dean of the faculty to succeed Dr. John G. Fitz Gerald. Dr. Gallie was graduated from the University of Toronto in 1903 and is a fellow of the Royal College of Surgeons of England and of Canada. In 1931 he was president of the American Orthopedic Association. Dr. Fitz Gerald resigned June 30 to take charge of a survey of methods of teaching preventive medicine sponsored by the Rockefeller Foundation.

LATIN AMERICA

Brazilian Orthopedic Society Formed.—Announcement is made of the formation of the "Brazilian Society of Orthopedics and Traumatology," with headquarters in São Paulo. Dr. Luis de Rezende Puech, São Paulo, is president and Dr. Renato da Costa Bomfim, São Paulo, general secretary. The society was to hold its first congress in June at São Paulo.

FOREIGN

Bárány Jubilee Fund.—Early last spring an appeal was sent out by a special committee to otolaryngologists in all countries asking them to participate in celebration of the birthday of Prof. Robert Bárány, professor of diseases of the ear, nose and throat, University of Upsala, Sweden, and winner of the Nobel Prize in medicine in 1914. They were asked to send a greeting to Professor Bárány and a contribution to a Robert Bárány Jubilee Fund to be used according to his decision. Since Professor Bárány died April 8, the committee has decided to send the greetings received to his widow in Upsala and to present the contributions to the university. Interest on this fund will be used to prepare a medal to be awarded every five years by the medical faculty to the author of the best work published during the preceding five years on "The Static Sense," in the widest interpretation of the term. Collection of funds will continue till the end of 1936. Contributions will be received by Dr. Gunnar Holmgren, Sabbatsbergs Sjukhus, Stockholm, postoffice current account No. 150241.

Foreign Letters

LONDON

(From Our Regular Correspondent)

May 30, 1936.

The League of Nations and Drug Addiction

In a report just published by the League of Nations, the number of drug addicts in the world is estimated at 2,000,000, of which 30,000 are in Britain. This number does not include opium smoking, a vice to which millions are addicted. The advisory committee on the opium traffic, now sitting, has found that in the last five years the price of illicit morphine has increased from $10 to $130 an ounce. This is due to the increased restrictions, which make the drug more difficult to obtain. Traffickers have had to resort to stealing from pharmacists. In China the police are using dogs, which can scent opium when it is cleverly concealed by a smuggler or addict. Mr. Fuller, the United States representative, has suggested to the advisory committee the need for greater restrictions in harbors and in vessels in port.

The Chinese government has appealed to the league for the cooperation of the governments concerned in ending the illicit drug traffic. The investigations undertaken on behalf of the league have shown that the situation in China is partly due to the inadequate penalties imposed by Japan on Japanese drug traffickers. Accordingly the committee of the league noted with satisfaction the measures already taken by the Chinese government for suppressing the clandestine manufacture and illicit traffic. The committee also addressed an earnest appeal to Japan to apply effective penalties. It also recommended all governments to prevent their nationals from engaging in the traffic in China. In the course of the discussion the Japanese delegate referred to the statements by Colonel Sharman of Canada that Japan was the source of smuggled drugs obtained after the arrest of traffickers in Vancouver. He said that for some time the authorities at Kobe had been giving attention to the increased drug traffic with North America. The result was the arrest of twenty-six persons who constituted the center of an organization responsible for many of the cases reported from the Pacific. The Vancouver case was being studied by the Japanese government.

Recognition of Indian Medical Degrees

Some time ago the General Medical Council withdrew recognition of Indian medical degrees because it was not satisfied with the standard of the examinations. In his presidential address to the council, Sir Norman Walker made an important statement on the subject. He said that the council had the duty of ascertaining the sufficiency of the examinations leading to qualification. Before 1920 it accepted for registration the degrees and diploma of the Universities of Bombay, Calcutta, Lucknow, Madras and the Punjab. In 1921 a questionnaire was addressed to these universities and the replies showed that the teaching of midwifery did not, except in Madras, reach a standard that would be recognized in the United Kingdom. To solve a difficult question he had accepted an invitation from the secretary of state for India to proceed to that country and discuss the difficulties with the authorities there. In his report made in 1922 he expressed the opinion that each of the universities could bring its regulations sufficiently into accordance with the requirements of the council to enable it to recognize its diploma. He proposed that Col. R. A. Needham, deputy director general of the Indian Medical Service (the medical service of the army in India), should be made medical inspector of the medical teaching in the Indian schools. Acting on his report, the council recognized the degrees. On revisiting India in 1926 he found that general improvement had been made almost everywhere, and not least in obstetrics. In 1933 an act was passed constituting a medical council of India on lines similar to those of the General Medical Council in England. Bombay had in the Ness Wadia Maternity Hospital the best maternity hospital he had seen anywhere, with an even larger number of cases than the Rotunda of Dublin. The Indian Medical Council, which now inspected and visited the Indian universities, had forwarded reports on these. The executive committee of the General Medical Council had resolved that the degrees of M.B., B.S., granted by the Universities of Bombay, Lucknow and Madras, which formerly were registerable, should again be recognized for registration if granted after May 1935.

THE NUMBER OF MEDICAL STUDENTS

The president announced that the number of medical students registered in England in 1935 was 1,363, the second highest on record, twelve less than in the peak year of 1919, and 269 more than last year. Scotland had five fewer at 719 and Ireland eleven fewer at 521.

The Value of Snuff Taking

The practice of snuff taking has declined greatly in England. It was at its height in the eighteenth century and continued down to the middle of the nineteenth, when it fell away. Letters in the *Times* from Sir Buckstone Browne (a retired urologist and a munificent donor to the Royal College of Surgeons) advocating snuff taking as a prophylactic against colds in the head has revived interest in the subject and led to a paper on it, which was read by Dr. J. D. Rolleston before the Society for the Study of Inebriety. He said that the habit, which once was in vogue in court circles, seemed likely at one time to find its last refuge in infirmaries and mental hospitals. He suggested that one reason for its disfavor was the great objection of Queen Victoria to any one sneezing in her presence. Sir Buckstone Browne told the society that his experience with the virtues of snuff dated from his early days in practice when, after operations early in the morning and seeing patients more or less continuously until the afternoon, when he had to start on his carriage visits, very tired, he found snuff refreshing and useful. He attributed his immunity from colds in the head to the action of snuff in stimulating the nasal mucous membrane and producing a flow of mucus. Pepper and other irritants would of course also induce sneezing, but tobacco snuff was more than an irritant. It was agreeable to most people, stimulating at first and then narcotic and astringent to the mucous membrane. His advice to the audience was: "If you think you are sickening for a cold in the head, take a good pinch of snuff before going to bed and you will awake quite well in the morning."

Some Reduction of Road Accidents

The constant adoption of new precautions against road accidents seems to have made some impression, as the figures for 1935 show some reduction in their number. In that year the road accidents numbered 195,892, against 204,710 in 1933. The number of persons killed or injured was 228,228, against 238,946 in the previous year. The number of killed was 6,502, against 7,343. Accidents in London amounted to 50,207, of which 1,077 were fatal. The number of persons killed or injured numbered 56,072.

Precautions Against Air Raids

The extensive nature of the precautions now being taken against air raids is shown by a scheme brought forward by the borough council of Croydon (a populous district on the outskirts of London). It involves the training of 300 volunteer firemen, the appointment of thirty auxiliary turncocks, the purchase of extra fire appliances, extension of the fire alarm system to all hospitals and to future first aid stations, and the acquisition of gas masks and protective clothing. It is also

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proposed to mobilize local physicians for duty at first aid and casualty clearing stations. The Red Cross Society and the St. John Ambulance Brigade will continue their present training of a corps of 500 men and 500 women for specific duties during air attacks. The scheme also includes equipment for the decontamination of people, vehicles and roadways, and for the registration of private vehicles for ambulance and fire brigade service. A register is to be opened of persons willing to act as street wardens to see that every householder is acquainted with the official instructions regarding precautions, and arrangements have been made for rendering one room gas proof.

PARIS

(From Our Regular Correspondent)

June 20, 1936.

Relation of Typhoid to Shell-Fish

The relation of typhoid to shell-fish on the southern coast of France was the subject of a paper by one well qualified to discuss it, Teissonière, at the April 23 meeting of the Académie de médecine of Paris. A law which has been in force since 1923 governing the cultivation of oysters ought to be extended to all shell-fish, especially clams. Since the oyster beds have been subjected to government control, not a single case of typhoid in Nice or Cannes has been found that was due to the ingestion of oysters. On the other hand, thirty-nine cases of typhoid at Nice and twenty at Cannes were traced to the ingestion of clams and similar shell-fish. The bacteriologic test, consisting in determining the number of B. coli organisms to 100 cc., cannot be strictly applied to shell-fish. For example, if oysters contain from 100 to 700 B. coli organisms per liter of water they are usually regarded as not being safe to eat, yet a large quantity of such oysters were consumed at Cannes without a single case of typhoid developing. In the Netherlands and the United States, according to Teissonière, a B. coli content of 10,000 organisms per quart (liter) is considered safe for oysters, while in England the figure is from 5,000 to 10,000 per quart. These percentages are much higher than hygienists consider safe for drinking water, wherefore no figure has been established in France as yet for all shell-fish. It is far more important from the standpoint of the public health officer to study the topography of the region in which the beds are located and the method of transportation.

In spite of the assertion that it is impossible to obtain edible clams, Teissonière maintains that this can be done. Such establishments exist along the Mediterranean coast of France. Twenty-six bacteriologic analyses taken Oct. 26, 1935, in one of the beds where clams are cultivated reveal the absence of B. coli, whereas specimens taken near Bouzigues, one of the seaports, show 1,000 B. coli organisms per liter. The danger of infection arises chiefly in clams, which are obtained by fishermen, because contamination in such cases is difficult to control except in the case of oysters. Clam beds exist all along the shore, so that the limitation to certain areas is not as easily carried out for clams as for oysters, which are limited to certain areas. Clams prefer to grow in water that is not salty and hence prefer water coming from rivers. These are usually near cities, the sewers of which empty into the rivers and thus favor absorption of infected water by the clams. Therefore fishing for clams ought to be prohibited here. In cities such as Cannes and Nice, cases of typhoid from polluted oysters no longer occur, but in other Mediterranean cities, such as Toulon and Marseilles, this is not the case; 265 cases of typhoid were reported at Marseilles last year and 118 at Toulon. Of the latter, forty-three were due to the ingestion of infected shell-fish. The crux of the situation is to have better control over the shell-fish, especially clams.

Cardiac Erethism in Adolescents

At the Société médicale des hôpitaux of Paris, April 24, an army surgeon, Bénard, reported his observations of recruits during the past seventeen years. Some young men were unable to march at a rapid pace or do gymnastic exercises without complaining of so much palpitation and dyspnea that they were obliged to cease walking or working in the gymnasium. The question was whether these recruits were malingerers or whether some form of cardiac insufficiency existed. For a long time Bénard was unable to find any cause for this erethism or increased cardiac activity. He was only able to note on the recruit's card that he seemed to be truthful in his complaints, that no valvular lesion could be found and that he should be excused from gymnastic exercises. The late Professor Vaquez was the first cardiologist to employ the term "erethism" to characterize "a certain degree of increased cardiac activity, felt as palpitation and heard on auscultation, at times difficult to distinguish from the presystolic purring of a mitral stenosis." Bénard described an average case. "Erethism" is most commonly observed between the ages of 10 and 18 years but can continue to between 22 and 25 years. The most common subjective complaint is dyspnea on exertion, often after having run a distance of 50 yards. The dyspnea and rapid heart action decrease as soon as the physical effort ceases. In others, the chief complaint is of palpitation on exertion. In about half the cases, auscultation reveals a systolic murmur at the base at the level of the second left intercostal space, best heard as a rule when the recruit is lying down, rarely better on standing up. Clinically, one can distinguish an atypical type (form fruste), a typical type, with palpitation and dyspnea and a rare type with decompensation. As objective evidence, Bénard presented the energy of the heart's contraction, murmur over the pulmonary area, increased size of middle portion of aortic arch, absence of enlargement of left auricle in a posterior direction, and certain electrocardiographic changes. He believes that these cases of "erethism" are due to a congenital stenosis of the pulmonary artery. The prognosis is good and no special treatment is indicated. Such cases have often been diagnosed as "war heart" or "irritable heart" and at times as mitral stenosis.

Acute Leukemia After Treatment of Arthritis with Gold Salts

Another one of the potential complications of the use of gold salts in the treatment of such diseases as pulmonary tuberculosis and arthritis was reported by Boulin, Coste, Uhry and Antonelli at the April 24 meeting of the Société médicale des hôpitaux of Paris. A woman, aged 51, was admitted to the hospital Oct. 11, 1934, with the diagnosis of chronic arthritis deformans and an associated psoriasis, for which she had been treated in the outpatient department since 1930. Following a first series of gold salts in 1931 there was a marked improvement of the arthritis. The treatment was resumed in February 1934 but discontinued in May. Several injections of gold salts (chrysalbin) in small amounts were given about Oct. 15, 1934. The blood examination about two and again four weeks later revealed a marked decrease of red and white cells as well as of the polymorphonuclear leukocytes. Two months later the patient had a severe sore throat and a furunculosis of the gluteal and elbow regions complicated by extensive subcutaneous ecchymoses, necrosis and bleeding from the gums. The blood picture at this time was that of an agranulocytosis and later that of an acute leukemia. The patient died Jan. 14, 1935, and the necropsy revealed a glomerulonephritis without involvement of the tubules, and marked cellular infiltration of the liver and of the hematopoietic viscera. The treatment with gold salts was considered to be responsible for the acute leukemia. A similar case was reported by Coste in 1934.

According to the authors of this paper, gold salts should be placed in the same group as roentgen rays, radioactive agents, benzene and tar as giving rise to an acute leukemia.

Public Health at the 1937 Paris Exposition

A certain number of daily conferences on public health questions are being arranged for the 1937 Paris Exposition of Arts and Technic in Modern Life. The five subjects chosen for general discussion include clothing, food, transports and physical education (games and sports). An attempt will be made to show that violation of the laws of hygiene favors development of disease, and the various resultant forms of the latter will be the subject of a number of conferences. A public health code will be formulated to which every one engaged in the study of the preservation of the race can refer. Daily conferences are to be arranged on the subjects of maternity and infancy, school hygiene, military medicine and pharmacy, hygiene in the colonies, aviation and merchant marine, urbanism, dwellings and social organization. The journal *Social Hygiene* has assumed the task of organizing these international conferences on public health, to be held July 1-10, 1937. Special tourist rates, lodgings and all other information can be obtained through the secretary, 2 rue Chauchat, Paris. The conference committee is especially anxious to obtain the cooperation of physicians, dentists, druggists, veterinary surgeons, architects, city planners, sanitary engineers, social workers, nurses and industrial organizations.

Rechloridation Treatment of Acute Nephritis

The treatment of all degrees of uremia by the administration of sodium chloride in concentrated solutions has been the subject of a number of papers read during the last two years at meetings of the principal Paris societies. An instance of the value of this treatment was presented by Lemierre and his associates at the March 20 meeting of the Société médicale des hôpitaux. The patient began to vomit about eight days before admission in January 1935. The emesis continued without a free interval for the entire eight days, so that ingestion of solid or liquid food was impossible. No cause could be found for the vomiting. There was a history of an attack of diphtheria in 1924.

On account of the presence of a grayish white exudate on the tonsils, the inner aspect of the cheeks and the soft palate, the patient had been sent to the hospital as having diphtheria, but this diagnosis was discarded because no specific bacilli were found. The vomiting had stopped shortly before admission to the hospital, but the marked stomatitis and fetid strongly ammoniacal odor of the breath led to the suspicion of uremia as the underlying cause. Examination of the blood revealed a urea content of 415 mg. per hundred cubic centimeters and a marked hypochloremia but an almost normal carbon dioxide combining power (47.9 volumes per cent). On the third day after admission a generalized scarlatiniform eruption appeared. The urine examination revealed no abnormal elements. January 31 (fourth day), 500 cc. of 0.9 per cent solution of sodium chloride was given subcutaneously. This was repeated during the next three days. In addition, 75 cc. of a 20 per cent solution of sodium chloride was given intravenously February 2, 30 cc. of the same hypertonic solution the following day, and 100 cc. of a 10 per cent solution of sodium chloride during the next two days. After February 7, the eruption had disappeared and the general condition improved rapidly. February 22 the blood urea was normal, 29 mg. per hundred cubic centimeters. Lemierre and associates believed that the pharyngostomatitis and ammoniacal odor of the breath were of uremic origin. Under the influence of the rechloridation treatment the high blood urea content disappeared and the hypochloremia rose to normal. The renal insufficiency and uremia were the direct results of the hypochloremia. Two days after the beginning of the rechloridation treatment the plasma chlorine rose to 2.41 Gm. and at the same time the evidences of urea retention in the blood receded. The cause of the severe emesis remains obscure. If the high blood urea had been due to a nephritis alone, there would have been a marked fall in the alkali reserve, which in this case was almost normal.

Polyneuritis Produced by Addition of Lactic Acid to Diet

As a result of his experiments, Lecocq has reached the following conclusions:

1. The addition of 10 per cent lactic acid in a diet suffices to prevent utilization by pigeons of large doses of vitamin B. The pigeons die presenting symptoms of attacks of polyneuritis as in avitaminosis B.

2. Such a polyneuritis occurs whether glucides are given or not, even though the predominant element of the diet is constituted by proteins or lipoids.

3. The impregnation of the tissues by the lactic acid, which is the direct effect of the ingestion of such diets, appears to bear an etiologic relation to the polyneuritis attacks.

BERLIN

(From Our Regular Correspondent)

May 11, 1936.

The Problem of Bacterial Mutation

Prof. W. Seiffert, in elucidating some aspects of the question of bacterial mutation, before the Berlin Microbiologic Society, said that in dealing with the variability of bacteria distinction must be made between (1) true mutation or qualitative alteration of the genes, (2) changes in the arrangement of the genes (for example, deficiency or excess of a gene through bacterial fusion) and (3) modifications, that is, plasmatically conditioned variations without change in the gene. The existence of true bacterial mutation can be demonstrated in experimentation by means of the rate of mutation. The manifestation of bacterial variants does not bear relationship to the environment but is in proportion to the number of bacteria. The more bacteria developed the greater the number of variants, especially if the cultures are kept in cellophan tubes according to the Gildemeister method (which permits the passing out of the products of metabolism and the passing in of nutrient substances). The type of nutrient medium employed (nutrient bouillon, Ramon's toxin bouillon, synthetic ammonium lactate) is immaterial. Faulty nutrition inhibits growth; hence the appearance of variants. Changes in the arrangement of genes may take place. A paratyphoid B strain, for example, may appear in a nongaseous form. It is possible to breed from this original form whole R and S forms among which a gaseous retromutation never appears. The gene of gas formation thus would seem to be lost. In addition, observations of a Gärtner strain that in frequently repeated experiments produced only R forms evidenced that R and S forms propagate in apparently equal numbers.

In studying those modifications which are conditioned by environment, particular interest attaches to the "permanent modification" theory of Jollos, according to which modifications are phenomena of accommodation transferred from one generation to another.

On the basis of his own investigations, Seiffert states that permanent modifications do not exist. His reasons are: 1. The natural modifications of bacteria are always connected with environment (for example, the vine-leaf shape of colon bacilli on gelatin) and are not susceptible to habituation (for example, the normal growth of colon bacilli in the retrotransmission from gelatin to agar). Not the modification itself, then, but the capability of manifesting modification is hereditable. Mutations without specific external cause which bear outward resemblance to a modification are, however, possible. 2. The natural func-

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tions of bacteria are not increased by exercise (for example, the formation of hemolysin in staphylococci is not increased by blood agar passage). 3. A stimulation of natural functions (of toxin formation of staphylococci by carbon dioxide, for example) is not transferable from generation to generation (demonstrated by experimentation with staphylococci). 4. The reversion in so-called permanent modifications is not a gradual process common to all individuals but rather represents a complete change in certain single persons. Reports in the literature of "permanent modifications" frequently mention the processes of selection, which are complicated by the appearance of true mutants.

The results of Seiffert's rejection of permanent modifications are of practical importance. 1. Since each type possesses its own sharply outlined rate of mutation which keeps it within the bounds of the type character, mutations from type to type are categorically rejected. Single characters may vary completely and independently; for example, characters of colon bacilli such as indole formation, gas formation, clotting of milk and decomposition of lactose. If typhoid bacilli can be developed from colon bacilli through mutation, then either intermediate stages must exist (namely, typhoid bacilli capable of forming gas or indole or of decomposing lactose), or else superimposed unspecific forms must appear in experimentation, presumably produced by fission of colon bacilli as well as typhoid bacilli. However, neither of these conditions eventuates. On the other hand, type to type mutations are possible in the Salmonella group, for example, wherein unspecific variants of the R form are actually found, one type overlapping the other. The concept of a specialization of differing types from one and the same R form is therefore permissible with regard to this group. 2. The hypothesis that by habituation to the animal organism saprophytes may be changed to parasites or avirulent strains to virulent strains is untenable. The only value of the animal experiment is that it permits, from a mixture of virulent and avirulent micro-organisms, the virulent ones to be selected and their growth increased. 3. There is no hereditary degeneration nor any nutrient medium degeneration. Degeneration takes place only in the phenotype; it may be conditioned by the age of the cultures (old gram-negative staphylococci, for example) but may also appear in fresh cultures subjected to unfavorable influences (involution). Since mutability of bacteria is not a degenerative phenomenon, the appearance may be expected of mutants, without being exposed to selection, in any environment which favors growth to the same degree as the nutrient bouillon. 4. There are no developmental cycles of bacteria, nor are there any fertilizing processes (if, for example, a gaseous paratyphoid R form and a nongaseous paratyphoid S form are brought together in bouillon, only the original forms will appear in cultures and the gaseous S form will be as regularly absent as the nongaseous R form; both the later types will appear, however, if a fertilization, that is, an interchange of genes, takes place). The Pettenkofer theory is likewise rejected, since the spherical formation appears only in certain variants, when these variants have been obtained from a form entirely free of Pettenkofer's parasites of bacteria. It is indicated from thoroughgoing experimentation that bacterial deformations result from a (variable) salt sensitivity: alkalis favor cytolysis (according to tests with sodium chloride and lithium chloride) and magnesium inhibits the cell division (filiform growth).

The Physicians' Mutual Insurance Association

The Deutsche Aerzteversicherung auf Gegenseitigkeit has been in existence more than fifty years. According to the annual report there were on Dec. 31, 1934, some 20,000 German physicians representing total insurance holdings valued at 327,900,000 reichsmarks. The annuity rates of policyholders are based on an amount ten times the yearly premium. In 1934, 7,700,000 reichsmarks was collected in premiums due; earned increment on the capital amounted to 3,000,000 reichsmarks, income from other sources to 6,200,000 reichsmarks. For disabilities incurred, 4,200,000 reichsmarks was paid out in 1933 and 52,500,000 in 1934. Despite the further decrease, interest on mortgages as authorized by the national government as of Jan. 1, 1934, still showed an average yield of 6 per cent on the total capital investment. According to the statement of financial condition on Dec. 31, 1934, the assets were invested, among other things, 7.3 per cent in real estate, 71.3 per cent in mortgages, 15.6 per cent in securities and loans on securities. Costs of administration totaled around 240,000 reichsmarks; that is, 3.1 per cent of the current income from annual premiums. This represents a figure about half that of the insurance organization, the administrative expenses of which rank next lowest to that of the Physicians' Insurance. It also represents an amount equal to one fourth, at most, of the administrative costs of the great commercial insurance companies.

The mortality among the insured was below expectancy and the favorable progress of the disabled was noteworthy.

Gas Casualties During the World War

J. Wirth, who served during the war as technical adviser on antigas defense and compiler of gas casualties for the Prussian war ministry, recently addressed the Medical Society of Frankfort-on-Main. He gave the following figures for the proportion of gassed patients to the total number of the German wounded:

Period	Percentage of Asphyxia Cases	Number of Asphyxia Cases in Hospital
1914-1915	0.01	87
1915-1916	0.85	6,485
1916-1917	2.2	17,480
1917-1918	4.6	43,699

For the French army the corresponding percentage was 17.5 in 1917-1918, and that for the American forces, still following Wirth's statistics, was 31.5 per cent. The number of men on the German side gassed during 1918 amounted to 15.6 per thousand. Among the British the rate was 57.2. Wirth attributes this noteworthy disparity to the more effective conduct of gas warfare by the Germans as well as to their better defensive measures and drills against gas attack.

The mortality among those suffering from war gas asphyxia depends on several factors: 1. The nature of the attack; that is, the frequency with which different methods of projection (grenades, projectors, gas mines) were used. The latter two methods of gas attack are the more deadly because they permit a greater concentration of gas at the objective of attack. 2. The measures taken for protection against gas and the efficacy of discipline in face of surprise attacks in particular. 3. On the precise circumstances of the asphyxia and whether or not dichlordiethylsulfide (yellow cross or mustard gas) was the principal substance employed. Although mustard gas is responsible for the largest number of casualties, especially because of the blistering of the skin that accompanies the asphyxiation, it causes fewer fatalities than certain other gases, "green cross," for example. An average of from 6 to 7 per cent of the asphyxia cases terminated fatally. Of importance too are the casualties inflicted by carbon monoxide (in concentration of more than 0.05 per cent) which is released in enemy dugouts by the explosion of gas mines; dangerous concentrations are found in shell craters as well.

With regard to the importance of casualties due to gas warfare, Senior Staff Surgeon Muntsch, who has made a special study of the question for the military authorities, calculates that, among all the forces engaged on the Western Front in 1918, gas asphyxia cases accounted for 18 per cent of the total

number of wounded. Muntsch's further investigations elicited the noteworthy fact that among the French during the operations in Champagne from Aug. 6 to Sept. 25, 1918, 42,702 men suffering from gas asphyxia were given treatment on the hospital trains, a number equal to 30 per cent of the total number of wounded received by these trains during the same action.

Data are lacking which would help determine the damage caused by gases released in aerial bombardment during the World War, but in any case the bombing of a town depends for its value on the shattering and incendiary effect. The assumption may be made, however, that the effectiveness of the aerial gas attack (like that of the ground attack with projectors or mines) depends largely on two factors: the ability of the raider to surprise the enemy and the amount of concentration at the point of striking. Hence the drilling and protection against gas attacks among the civil population at home should be kept on a level with that practiced by the army in the field.

ITALY

(From Our Regular Correspondent)

May 4, 1936.

Society Reunion

The Accademia Medica of Rome met recently under the chairmanship of Professor Alessandri. Professor Penso spoke on a disease of hog herders. The incubation period lasts several weeks and is followed by intestinal disturbances, after which a meningeal syndrome develops. Laboratory investigations have given negative results as yet. Recovery usually occurs.

Professor Baglioni discussed the effects of the administration of gelatin and casein and the results produced by the addition of mineral salts to the administration of proteins. The fact, also noted by Zagami, that fasting stimulates the accumulation of nitrogen substances during realimentation, although it explains the nitrogen metabolism during convalescence from acute diseases, proves that a parallelism between the increase of weight and the retention of nitrogen by the organism does not exist. This fact was verified by the results of Baglioni's experiments on the nitrogen metabolism of rats fed with special proteins.

Professor Testoni reviewed his experiments, which proved that splenectomized animals regain weight by realimentation following fasting more quickly than normal animals.

Professor Testoni studied the passage of certain drugs through the placenta. The passage of thallium from mother to fetus depends on the dose, duration of treatment, period of evolution of pregnancy and species of animal. Cataract and iritis are the only lesions detectable in fetuses from animals chronically intoxicated by thallium acetate. Probably these pathologic conditions found in the fetuses are due to a selective action of thallium on the parathyroids.

Dr. Liberti discussed the cerebrospinal fluid in human tetanus. The tetanus toxin cannot be detected in the fluid, even by resorting to special procedures, such as chloroformization, etherization and production of experimental meningitis. Antitoxin is detectable in the fluid in all cases but especially after provocation by chemical irritation of the meninges.

Drs. Serianni and Lolli discussed the effects of insulin and morphine on glycemia in normal persons and in patients suffering from diabetes mellitus. Morphine given alone causes hyperglycemia, which is more marked in diabetic than in normal persons. Morphine, when given in association with insulin, increases the hypoglycemic action of the latter, both in normal persons and in the diabetic.

Dr. Minz studied the action of insulin on provoked alcoholemia in seven diabetic patients. Alcoholemia in persons with diabetes is not lowered by insulin, although it is lowered by the latter in normal persons.

NETHERLANDS

(From Our Regular Correspondent)

May 12, 1936.

Diphtheria in the Netherlands

A report by Dr. Josephus Jitta containing data on the morbidity from diphtheria in the Netherlands has been submitted to the International Bureau of Hygiene.

The following table represents the incidence of diphtheria cases among the total population of some 8,000,000 inhabitants of the kingdom during the five years from 1930 to 1934:

Incidence of Diphtheria in the Netherlands

	1930	1931	1932	1933	1934
Cases reported	7,450	5,693	5,353	4,251	2,990
Deaths	439	311	272	193	143
Morbidity per 10,000 population	9.51	7.19	6.64	5.19	3.61
Death rate per 10,000 population	0.56	0.39	0.34	0.24	0.17
Percentage of fatal cases	5.9	5.5	5.1	4.5	4.8

No official instructions are issued prescribing or recommending antidiphtheritic immunization. The official public health organs, however, carry on propaganda with the tacit approval of the government. In North Holland Province, among a total population of 325,000 residing in fifty communes, not including Amsterdam and Haarlem, 29,200 were inoculated. It may be accepted as a fact that by Jan. 1, 1935, 25 per cent of the children of North Holland had been inoculated under the supervision of the official examiner. In Amsterdam from 1929 to Jan. 1, 1935, 37,969 children were presented for immunization and 32,162 underwent the complete treatment.

Antivenereal Disease Campaign

In the conduct of an antivenereal disease campaign, each country selects a method in keeping with the national character. This explains why in the Netherlands the organization of this campaign is imbued with a spirit of independence and of hatred for coercive measures. In place of official examinations of the genitalia of prostitutes and the compulsory registration of those infected, a policy based on persuasion and free will has been instituted. This operates through therapeutic stations open during the evening hours. The work of the stations is supplemented by consultation offices and by the cooperating services of women social workers who visit the infected women undergoing treatment. Thus diseased prostitutes, assured that no compulsion is involved, submit voluntarily to treatment. It is the same approach that has been used with notable success in the fight on tuberculosis. In addition, propaganda against the venereal diseases is carried on through lectures, moving pictures, and so on. The results in big cities such as Rotterdam have been most encouraging.

The Number of Physicians

The report of the Limburg Commission on the future of academic graduates has been published. It shows that during the period from 1905 to 1934 the number of general practitioners increased from 2,322 to 3,548, while the number of specialists increased from 347 to 1,241. The total number of physicians in the Netherlands, including army and employed civilian physicians, amounts to 5,886. In the Dutch East Indies there are still 1,200 physicians, 700 of whom hold diplomas from the home country. Of more recent graduates, 60 per cent have not attained the level of an annual income of 5,000 florins in five years subsequent to receiving their degrees. About 70 per cent of medical students complete their studies; 534 young physicians are seeking employment. In 1934 there was one physician to each 1,720 of population; by 1939 the ratio will be one to each 1,360 of population.

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Marriages

WOLFGANG FRITZ JUSTUS VOGEL of Huntingdon, Pa., to DR. HELGA ELIZABETH STREITBERG of Leipzig, Germany, April 9.

LUTHER F. GRANT, Liberty, N. Y., to DR. SIRKKA ELISABETH VUORNOS, Boston, in New York, April 27.

JAMES HENDERSON CHERRY, Asheville, N. C., to Miss Katherine G. Buck of Bald Mountain, April 18.

LEO BOYES FREEMAN, Germantown, Pa., to DR. RUTH FRAZER HARRAL of Drexel Hill, June 20.

BLAKE M. LANCASTER, Manatee, Fla., to Mrs. Edward Livingston of Bradenton, April 25.

ELDON L. BOLTON, Biloxi, Miss., to Miss Carolyn McKellar of Memphis, Tenn., May 23.

WILLIAM THOMAS BRAUN JR. to Miss Marion Helen Briglia, both of Baltimore, May 17.

LESTER J. GREENBERG to Miss Janet Bogomolny, both of Brooklyn, May 31.

THOMAS A. ANGLAND to Miss Betty Brush, both of Yakima, Wash., April 25.

Deaths

Wells Ferrin Smith, Little Rock, Ark.; Beaumont Hospital Medical College, St. Louis, 1898; member of the Arkansas Medical Society; president of the Arkansas State Board of Health; past president of the State Medical Board of the Arkansas Medical Society; professor of surgery, University of Arkansas School of Medicine; member of the board of governors and fellow of the American College of Surgeons; member of the surgical staff of the Baptist State Hospital; member of the staff of St. Vincent's Infirmary and the Children's Home Hospital; consulting surgeon to the Little Rock General and Veterans' Administration hospitals, and the Working Women's Home; aged 64; district surgeon to the Missouri Pacific Hospital, where he died, May 19, of cerebral hemorrhage.

Campbell Palmer Howard, Montreal, Que.; McGill University Faculty of Medicine, Montreal, 1901; professor of medicine at his alma mater; at one time head of the department of internal medicine, State University of Iowa College of Medicine, Iowa City; member and past president of the Association of American Physicians; member of the American Society of Clinical Investigation and the American Association of Pathologists and Bacteriologists; served with the Canadian Army in the World War; director of the department of medicine, Montreal General Hospital; member of the senate of McGill University; contributor to several systems of medicine and to the periodical literature; aged 59; died suddenly, June 3, while in Santa Monica, Calif., of pulmonary embolism following phlebitis.

George Andrew Hare ✠ Fresno, Calif.; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1887; member of the House of Delegates of the American Medical Association, 1912-1915; past president of the American Academy of Medicine and of the Fresno County Medical Society; formerly vice president of the California Medical Association; in 1906 delegate to the International Medical Congress in Lisbon; at one time superintendent of the Washington Sanitarium, Washington, D. C.; formerly associate editor of "Life and Health"; aged 78; died, April 4, of carcinoma of the prostate gland.

Wesley Wilbur Beckett ✠ Los Angeles; University of Southern California College of Medicine, Los Angeles, 1888; a practitioner in Los Angeles since 1889; professor of gynecology and surgery and later emeritus professer of surgery at his alma mater; past president of the California Medical Association, Los Angeles County Medical Society, Los Angeles Clinical and Pathological Society and the Southern California Medical Society; formerly member of the city board of health; medical director of the Pacific Mutual Life Insurance Company; aged 79; died, June 3, of cerebral hemorrhage.

Melbourne Clements, Seattle; Rush Medical College, Chicago, 1910; at one time a practitioner in Chicago; formerly assistant demonstrator of dermatology, Jefferson Medical College of Philadelphia, assistant in surgery (genito-urinary) and clinical associate in surgery (genito-urinary) at his alma mater; during the World War served as chief medical officer of the transport *Wilhelmina;* graduated from the Cincinnati Conservatory of Music and was a violinist in the medical society orchestra; aged 51; died, April 26, in the Firland Sanatorium of pulmonary tuberculosis.

James Walter Walker, Fayetteville, Ark.; Washington University School of Medicine, St. Louis, 1915; member of the Arkansas Medical Society; past president and secretary of the Washington County Medical Society; was on the reserve list of the Reserve Officers Training Corps during the World War; fellow of the American College of Surgeons; formerly secretary of the State Medical Board of the Arkansas Medical Society; county health officer; member of the staff of the Fayetteville City Hospital; aged 56; died, May 4.

Joseph Norman Fogarty, Daytona Beach, Fla.; Columbia University College of Physicians and Surgeons, New York, 1898; member of the Florida Medical Association; formerly secretary of the Monroe County Medical Society; at one time member of the state board of medical examiners, health officer of Key West, mayor of Key West and St. Augustine and member of the state legislature; for many years chief surgeon of the Florida East Coast Railroad; aged 60; died, May 5, in the New York Post-Graduate Hospital.

Charles Sherman Little, Thiells, N. Y.; Dartmouth Medical School, Hanover, N. H., 1896; past president of the Rockland County Medical Society; member of the Medical Society of the State of New York and the New England Society of Psychiatry; past president of the American Association on Mental Deficiency; since 1910 superintendent of the Letchworth Village; superintendent of the State School for the Feebleminded, Laconia, N. H., from 1902 to 1910; aged 67; died, June 6, of angina pectoris.

Archibald Campbell MacLeish ✠ Los Angeles; University of Southern California College of Medicine, Los Angeles, 1908; associate clinical professor of surgery (ophthalmology) at his alma mater; member of the Pacific Coast Oto-Ophthalmological Society; fellow of the American College of Surgeons; member of the staff of the Hospital of the Good Samaritan and the Barlow Sanitarium; aged 52; died suddenly, May 3.

Hugh MacDougal Hart, Newark, N. J.; College of Physicians and Surgeons, Medical Department of Columbia College, New York, 1894; member of the Medical Society of New Jersey; for many years surgeon for the city fire department; aged 63; died, April 24, of congenital polycystic kidneys and cardiovascular renal disease.

Joseph Budd Hulett, Middletown, N. Y.; College of Physicians and Surgeons, Medical Department of Columbia College, New York, 1887; member of the Medical Society of the State of New York; for many years member of the board of health; died, April 8, of cerebral hemorrhage and bronchopneumonia.

Albert Triplett Horn, Chicago; College of Physicians and Surgeons, Baltimore, 1904; member of the Illinois State Medical Society; formerly asslstant in anatomy, Northwestern University Medical School; on the staff of the Auburn Park Hospital; aged 56; died suddenly, April 19, of coronary thrombosis.

Alexander Francis Mosher ✠ South Glens Falls, N. Y.; Albany (N. Y.) Medical College, 1909; had been health officer of the consolidated health district comprising the town of Moreau and the village of South Glens Falls since 1926; aged 48; died, April 25, of endocarditis and myocarditis.

George Washington Gale, Saugus, Mass.; Berkshire Medical College, Pittsfield, 1861; member of the Massachusetts Medical Society; Civil War veteran; formerly chairman of the board of health and school committee; aged 99; died, April 20, of arteriosclerosis and cerebral hemorrhage.

Rodney Hall Richardson, Reno, Nev.; University of Pennsylvania Department of Medicine, Philadelphia, 1884; member of the Nevada State Medical Association; at one time superintendent of the Nevada State Hospital for Mental Diseases; aged 75; died, May 1.

James Otho Hardy, Las Animas, Colo.; Marion-Sims College of Medicine, St. Louis, 1897; member of the Colorado State Medical Society; for many years county physician and county health officer; served during the World War; aged 68; died, April 18, of angina pectoris.

David William Gass, Pickensville, Ala.; Birmingham Medical College, 1899; member of the Medical Association of the State of Alabama; veteran of the Spanish-American War; aged 68; died, April 19, in the Veterans' Administration Facility, Danville, Ill., of meningitis.

Samuel E. Hibbs, Uniontown, Pa.; Western Pennsylvania Medical College, Pittsburgh, 1904; member of the Medical Society of the State of Pennsylvania; aged 61; on the staff of the Uniontown Hospital, where he died, April 1, of carcinoma of the prostate.

Paul Allen Fox ✠ Beloit, Wis.; Rush Medical College, Chicago, 1895; past president of the Rock County Medical Society; president of the Beloit Clinic; on the staff of the Beloit Municipal Hospital; aged 64; died, April 27, of coronary occlusion.

John J. Osburn, Wheeling, W. Va.; Starling Medical College, Columbus, 1882; member of the West Virginia State Medical Association; on the staff of the Wheeling Hospital; aged 77; died, April 17, at Tuscaloosa, Ala., of facial erysipelas.

James W. Nixon, Holloway, Mich.; Western University Faculty of Medicine, London, Ont., Canada, 1892; member of the Michigan State Medical Society; aged 67; died, April 12, in the Emma L. Bixby Hospital, Adrian, of Vincent's angina.

William Wood Hobbs ✠ Raytown, Mo.; University Medical College of Kansas City, 1904; on the staff of the Menorah Hospital, Kansas City; aged 54; died, April 14, in a hotel at Kansas City, of a self-inflicted bullet wound.

William Columbus Hendrick, Shreveport, La.; Memphis (Tenn.) Hospital Medical College, 1908; member of the State Medical Association of Texas; aged 62; died, April 12, in the Tri-State Hospital, of chronic myocarditis.

Horace Stofflet Saylor, Altoona, Pa.; Temple University School of Medicine, Philadelphia, 1915; for many years relief doctor for the Pennsylvania Railroad Company; aged 47; died, April 5, of posttraumatic epilepsy.

Alfred Clarence Wilhelm ✠ Traverse City, Mich.; Chicago College of Medicine and Surgery, 1913; served during the World War; on the staff of the James Decker Munson Hospital; aged 46; died, April 9.

Burton D. Giddings, Niles, Mich.; Hahnemann Medical College and Hospital, Chicago, 1903; member of the Michigan State Medical Society; aged 62; died, April 29, of myocarditis and coronary sclerosis.

Ever A. Olson, Osseo, Wis.; College of Physicians and Surgeons, Keokuk, Iowa, 1880; aged 85; died, April 21, in the Sacred Heart Hospital, Eau Claire, of thrombosis of the superior mesenteric artery.

Ernest Leslie Bickford, Seattle; Missouri Medical College, St. Louis, 1890; served during the World War; aged 69; died, April 27, in the Veterans' Administration Facility, Salt Lake City, of heart disease.

Daniel Guedalyah Golding ✠ Santa Monica, Calif.; Jefferson Medical College of Philadelphia, 1890; aged 65; on the staff of the Santa Monica Hospital, where he died, April 27, of cerebral hemorrhage.

Edgar Joseph Geisinger, Unionville, Mo.; College of Physicians and Surgeons, Keokuk, Ia., 1878; for many years postmaster; aged 86; died, April 23, of chronic nephritis and prostate obstruction.

George Radcliffe Duncan, Oak Terrace, Minn.; University of Minnesota Medical School, Minneapolis, 1929; aged 32; on the staff of the Glen Lake Sanatorium, where he died, April 6, of tuberculosis.

Paul Gerhardt Sudhoff, Cincinnati; University of Cincinnati College of Medicine, 1921; formerly medical director of the Hamilton County Home and Chronic Disease Hospital; aged 41; died, June 9.

Elizabeth Eldredge Wray-Howell ✠ Chester, Pa.; Woman's Medical College of Pennsylvania, Philadelphia, 1896; aged 63; died, April 24, of rheumatic heart disease, myocarditis and endocarditis.

William Preston Hickman ✠ Harvey, La.; Tulane University of Louisiana Medical Department, New Orleans, 1908; aged 51; died, April 13, of cardiorenal disease, hypertension and arteriosclerosis.

Russell E. Hawley ✠ Merrill, Mich.; Detroit College of Medicine and Surgery, 1926; on the visiting staff of the Saginaw (Mich.) General Hospital; aged 36; died suddenly, April 12, of heart disease.

Solomon H. Barron, Hopewell, Miss.; Memphis (Tenn.) Hospital Medical College, 1905; aged 63; died, May 9, in the Baptist Hospital, Jackson, of hypertension and chronic myocarditis.

George Elliott Noggle, Chino, Calif.; Kansas Medical College, Topeka, 1895; member of the California Medical Association; aged 63; died, April 8, of adenocarcinoma of the cecum.

Lawrence Johnson Winder, Andalusia, Pa.; Jefferson Medical College of Philadelphia, 1893; veteran of the Spanish-American War; aged 69; died, April 22, of chronic myocarditis.

Fred Harrison, Gridley, Calif.; California Medical College, San Francisco, 1905; member of the California Medical Association; aged 65; died, April 24, of endocarditis and influenza.

David Rice Gooch, Nolensville, Tenn.; Vanderbilt University School of Medicine, Nashville, 1877; for many years member of the county school board; aged 82; died, April 6.

Tobias Higgins, Traphill, N. C. (licensed in North Carolina in 1915); aged 62; died, April 13, in the Wilkes Hospital, North Wilkesboro, of coronary occlusion and arteriosclerosis.

Robert H. Hunt, Gibson, Tenn.; University of Nashville Medical Department, 1872; Civil War veteran; for many years bank president; aged 90; died, April 6, in Humboldt.

May McKinney Palmer, Mercer Island, Wash.; Cooper Medical College, San Francisco, 1899; aged 71; died, April 23, in the Stanford University Hospital, San Francisco.

Robert E. Hughes, North Holston, Va.; University College of Medicine, Richmond, 1909; member of the Medical Society of Virginia; aged 51; died, April 13, of pneumonia.

George Young Hunter ✠ Prosperity, S. C.; Tulane University of Louisiana Medical Department, New Orleans, 1891; aged 67; died suddenly, April 30, in Columbia.

Clyde Oscar Anderson ✠ Pittsburgh; Western Pennsylvania Medical College, Pittsburgh, 1895; aged 65; died, May 18, of diabetes mellitus and coronary thrombosis.

John Walters ✠ Sewickley, Pa.; Western Pennsylvania Medical College, 1897; on the staff of the Valley Hospital; aged 62; died, April 24, of cerebral hemorrhage.

Michael Roberson, Durham, N. C.; Medical College of Virginia, Richmond, 1912; aged 51; died, April 30, of coronary sclerosis and pulmonary embolism.

James Porter Fuller, Modesto, Calif.; Michigan Homeopathic Medical College, Lansing, Mich., 1872; aged 92; died, April 10, of chronic myocarditis.

Trusten Polk Peery, Marysville, Calif.; Missouri Medical College, St. Louis, 1884; aged 78; died, April 16, of chronic myocarditis and acute nephritis.

Lillian Craig Randall, Rye, N. Y.; University of Buffalo School of Medicine, 1891; aged 77; died, April 17, of uremia and myocardial insufficiency.

Arthur Heinzelmann, Kansas City, Mo.; Eclectic Medical University, Kansas City, 1907; aged 58; died, April 4, of chronic nephritis and endocarditis.

Richard Hudson Beek ✠ Lakota, N. D.; University of Minnesota Medical School, Minneapolis, 1894; aged 66; died, May 6, in Devils Lake.

George Samuel Bailey ✠ Hillsboro, N. H.; College of Physicians and Surgeons, Boston, 1899; aged 68; died, June 24, of angina pectoris.

Henry Charles Darby, Wilmot, Wis.; College of Physicians and Surgeons of Chicago, 1883; aged 81; died, April 28, of coronary occlusion.

George W. Westbrook, St. Louis; American Medical College, St. Louis, 1897; aged 74; died, April 13, in Maplewood, Mo., of heart disease.

Jacob F. Roemer, Waukegan, Ill.; Hahnemann Medical College and Hospital, Chicago, 1891; aged 75; died, May 4, of heart disease.

Robert Ballard Davy, Hayward, Calif.; Jefferson Medical College of Philadelphia, 1868; aged 88; died, April 30, of myocarditis.

Hart M. Boxley, Millersburg, Ky.; Louisville Medical College, 1901; aged 65; died, May 8, of cardiorenal disease and hemiplegia.

Mary Hobbs Iredale Earle, Cincinnati; Eclectic Medical Institute, Cincinnati, 1891; aged 75; died, April 24, of intestinal obstruction.

Caleb W. Bronson, Alameda, Calif.; Hahnemann Medical College, San Francisco, 1884; aged 89; died, April 24, of arteriosclerosis.

Victor A. Bergeron, Kankakee, Ill.; Chicago Medical College, 1877; formerly a druggist; aged 82; died, May 6.

Frank A. Noyes, Biggsville, Ill. (licensed in Illinois in 1878); aged 86; died, April 4.

B. M. Doyle, Knoxville, Tenn. (licensed in Tennessee in 1889); died, April 24.

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Bureau of Investigation

"MEDICAL ECONOMICS"—A HANDBOOK OF NOSTRUMS

For some time physicians throughout the country have been receiving each month through the kindness (?) of some dealer in medical or chemical supplies a periodical called *Medical Economics* with the subtitle "The Business Magazine of the Medical Profession." It has previously been called by THE JOURNAL in editorial statements a "throw-away periodical." It has apparently little, if any, paid circulation although it is stated that the price is 25 cents a copy or $2 a year. It should be apparent to any one after glancing through the pages of any recent issue that this publication depends for its income and its circulation on the advertisements of great numbers of nostrums which from time to time have been investigated and rejected by the Council on Pharmacy and Chemistry of the American Medical Association. Following is a list of non-accepted preparations advertised in the issue of June 1936 with brief statements as to their records as far as the files of the Council on Pharmacy and Chemistry are concerned:

"Fellows' Syrup."—Rejected by the Council twenty years ago because it was held to be "a semisecret, unscientific preparation—an affront to sound therapy—exploited by means of extravagant and misleading statements."

"Antiphlogistine."—A preparation which has been exploited for more than a quarter of a century with unwarranted and extravagant claims. In 1929 the Bureau of Chemistry of the American Dental Association published a report stating that the "wonderful effects of the hygroscopic powers of Antiphlogistine are so manifestly absurd as to be unworthy of further refutation."

"Argyrol."—Once included in N. N. R. but omitted in 1928 because of the manufacturer's refusal to comply with the Council's rules on claims and nomenclature.

"Neobovinine with Malt and Iron."—In 1931 the Council declared "Neobovinine" unacceptable for N. N. R. because the information in regard to its composition is inadequate, because the therapeutic claims are unwarranted, and because the combination was considered unscientific.

"Taxol."—An unscientific mixture claimed to contain the total extract of the intestinal glands, biliary extract, and lactic ferments with agar agar. Has not been considered by the Council.

"Eskay's Neurophosphates."—An irrational mixture marketed with unwarranted therapeutic claims under an objectionable name. Rejected by the Council twenty years ago.

"Feosol Tablets."—A dosage form of ferrous sulfate, exsiccated-U. S. P. X, which has not been considered by the Council.

"Oxo-ate-B."—A proprietary, uninforming name for calcium orthoiodoxybenzoate. The iodoxybenzoates were omitted from N. N. R. in 1932 because of lack of evidence for their usefulness.

"U. S. T. (Tilden)" (formerly "Uterine Sedative Tonic").—Unscientific mixture of obsolescent drugs, reminiscent of the "female weakness" cures exposed many years ago.

"Ovaltine."—Reported unacceptable by the Committee on Foods in December 1931.

"Farastan."—A cinchophen derivative which the Council rejected in 1930 because it was held to be an irrational preparation marketed with unwarranted therapeutic claims.

"Ovoferrin."—Omitted from N. N. R. in 1929 as an unscientific and superfluous mixture.

"Viburno."—A viburnum preparation of the type exposed by the Council more than twenty years ago.

"Tablet Stanno-Yeast."—Probably a tin and yeast mixture. Has not been considered by the Council.

"Pancrobilin Tablets."—Appears to be a modification of an old Reed and Carnrick preparation, the composition of which has been held to be essentially secret and the claims for which are extravagant and unwarranted.

"Lorate."—A fanciful name for a sodium perborate mixture. Has not been considered by the Council.

"Nupercainal."—An unaccepted dosage form of a Council-accepted anesthetic.

"Calmitol."—Stated to be a "solution of Chloro-Camphoric aldehyde, slightly iodized," combined with menthol and a small amount of "Laevo-Hyoscine Oleinate, in an ether, alcohol, chloroform base." Has not been considered by the Council.

"Mu-col."—Rejected by the Council in 1913 for conflict with Rules 1, 4, 6, 8 and 10.

"Rao-Mucin."—Has not been considered by the Council.

"Sal Hepatica."—In 1914 the Council published its condemnatory report on this preparation "in order that physicians may know the extent to which they have been made to act as advance agents for 'patent medicines.'" Today Sal-Hapatica is a full-fledged "patent medicine."

"Occy-Crystine."—Has not been considered by the Council.

"Alkalol."—Examined by the A. M. A. Chemical Laboratory in 1915. In 1913 was the subject of the following comment by THE JOURNAL: "The polypharmacy represented by such a mixture is absolute nonsense—the really useful ingredients are obscured by the useless shrubbery which surround them."

"Aurocein."—Claimed to be "For the Gold Therapy of the Arthritides." Has not been considered by the Council.

"Taurocol."—A preparation to which the Council refused recognition in 1915 because of objectionable claims and composition.

"Unguentine."—Not considered by the Council. Reported on unfavorably by the A. M. A. Chemical Laboratory in 1909.

"Hepvisc."—A mixture of hepatic extract, insulin-free pancreatic extract and mistletoe, for high blood pressure. Has not been considered by the Council.

"Aspir-Vess," "Bromo-Vess" and "Cinsa-Vess."—Effervescent mixtures of well known drugs, which have not been considered by the Council.

"Burnham's Soluble Iodine."—Found unacceptable for N. N. R. in 1933. A semisecret preparation marketed with extravagant and unwarranted therapeutic claims.

"Tablet Alukalin."—Has not been considered by the Council.

"Kaba."—A Battle Creek Food Co. product comprising karaya gum plus yeast extract. Has not been considered by the Council.

"Ophthalmic Solution No. 2 (DeLeoton)."—Not considered by the Council.

"Dionol."—The "Glorified Petrolatum" about which THE JOURNAL in 1918 wrote as follows: "If one takes the word of the manufacturers, the therapeutic possibilities of Dionol are apparently limited only by the blue sky."

"Alucol."—Rejected by the Council in 1923 because of conflict with the rules regarding nomenclature and therapeutic claims.

"Vince."—A sodium perborate preparation which has not been considered by the Council.

"Glyco-Thymoline."—In 1914 the Council called it "a typical example of a 'patent medicine' advertised to the public through the doctors." At that time in conflict with Rules 1, 4, 6, 8 and 10.

"Stannoxyl."—A tin preparation for boils, etc., which THE JOURNAL criticized in 1920 because of extravagant claims.

"Gardner's Syrupus Acidi Hydriodici."—Under the English name "Gardner's Syrup of Hydriodic Acid," this preparation was rejected by the Council in 1908 because of unwarranted claims.

"Gude's Pepto-Mangan."—More than twenty years ago the Council called attention to the unwarranted claims made for this preparation and to the manufacturer's attempt to exploit the product to the public.

"Aminophyllin-Phenobarbital" and "Aminophyllin-Potassium Iodide" (Battle).—These aminophyllin mixtures have not been considered by the Council.

"Micajah Medicated Wafers."—Found unacceptable by the Council in 1919 because the composition is essentially secret, the name is not indicative of composition, the therapeutic claims were exaggerated and unwarranted and because the product was advertised indirectly to the public.

"Absorbine Jr."—A "patent medicine" which has not been considered by the Council. See "Nostrums and Quackery."

"Oliodin" (Iodinized Oil Compound).—Has not been examined by the Council.

"Saraka."—Contains an agar agar substitute plus the laxative drug frangula. Introduced under the name "Normacol" as an "ethical" proprietary and now advertised directly to the public.

"Evac-u-gen."—Has not been considered by the Council.

"Man-Na-Gluconate."—A "colloidal manganese sodium gluconate" preparation. Has not been considered by the Council.

"Mazon."—A preparation of semisecret composition which has not been considered by the Council.

"Endo-Antrone."—Stated to be "a standardized, anterior Pituitary-like preparation of sex hormones." Has not been considered by the Council.

"Viscysate."—A mistletoe preparation which has not been considered by the Council.

"Sanmetto."—In 1915 the Council called it "a secret nostrum the exploitation of which is an invitation to haphazard, uncritical therapy and a menace to public health."

"Uvursin."—An "oral diabetic treatment" reported on by the Bureau of Investigation.

"Kondremul."—Rejected by the Council in 1933 because of objectionable claims and name.

"Ceanothyn."—First rejected in 1926. Rejection reaffirmed in 1930. Claims unwarranted. Evidence for the usefulness of the product inconclusive.

"Ergoapiol (Smith)."—An unscientific, shotgun mixture of drugs having widely different therapeutic effects. Rejected by the Council in 1914.

"Cystogen."—A therapeutically suggestive name applied to the well known drug methenamine. Rejected by the Council in 1914.

"Ortho-Gynol."—Has not been considered by the Council.

"Cremo-Carbonates."—Has not been considered by the Council.

The physician who believes the majority of these advertisements and prescribes the preparations listed departs far afield from the tenets of scientific prescribing. And he practices an uneconomical "medical economics." He serves as an agent for

the introduction to his patients of unaccepted, trade-name medicinal preparations. Patients obtain the first purchase on his prescription; thereafter they buy these preparations over the counter, frequently to their own detriment. Thus the doctor becomes an agent for introducing these preparations to patients, who in turn urge them on their self-prescribing friends. In many of the trade packages, accompanying circulars and advertising matter will be found which has the obvious purpose of inducing self medication.

The manufacturer of legitimate medicinal products who associates himself with nostrums such as are promoted through the pages of *Medical Economics* is also figuratively cutting his own throat. Physicians interested in the advancement of scientific medicine and in the welfare of their patients, as well as in their own welfare, will do well to limit their prescriptions for medicinal agents to those items which are included in the U. S. Pharmacopeia and in New and Nonofficial Remedies.

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

HEAT OR COLD FOR PAIN OF APPENDICITIS

To the Editor:—What is the best method to relieve pain and "wall off" infection in acute appendicitis and also in acute mastoiditis? Is it better to apply the ice bag or the hot water bottle to the region of the mastoid or the region of the inflamed appendix? Why is it that some authorities claim that it is better to use heat, while others say to use ice? When is the right and proper time to use one or the other? If either ice or heat is used, should the heat or ice be continuous or should it be applied off and on—an hour on and about fifteen minutes to half an hour or so off? What is the best usage? I was taught in cases of acute appendicitis with a child or an aged person to apply the hot water bottle, while with all others apply the ice bag. I was also taught to apply the ice bag continuously. Please omit name. M.D., New Jersey.

ANSWER.—The pain of acute appendicitis is seldom severe enough to require morphine. In the presence of acute abdominal pains suggestive of appendicitis it is best not to give morphine or any other powerful opiate until the diagnosis is made, for fear of disguising the picture and delaying diagnosis. If the patient must be observed for a time before the diagnosis can be made and if pain must be relieved to a certain extent, from 0.03 to 0.065 Gm. of codeine by mouth is an excellent sedative. Often acetylsalicylic acid, aminopyrine or sodium bromide will give sufficient sedative reaction to control the pain of appendicitis until the diagnosis is made. In the case of acute mastoiditis, the nature of the infection is more evident and the relief of pain more imperative or more logical. Morphine, codeine or one of the milder sedatives can be safely used here.

The physiologic action of the ice bag or of the hot water bottle is practically the same. Both cause a localized hyperemia, but the thermic units, whether heat or cold, are soon disbursed by the blood stream in the wall of the abdomen. Thus, many authorities do not believe it makes much difference whether an ice bag or a hot water bottle is used. Many doubt if they have any influence in localizing or "walling off" infection in acute appendicitis. More relief of pain seems to be given by the use of the ice bag in acute appendicitis than of the hot water bottle.

LOSS OF HAIR DUE TO THYROID DEFICIENCY

To the Editor:—I have a healthy patient, aged 27, weight 155 pounds (70 Kg.), whose symptoms are falling of the hair, irregular delayed menstrual periods and gradual increase in weight. The hair is thin and not patchy. This falling of the hair is pronounced around menstrual time. She has had two pregnancies and all her symptoms date back to the first pregnancy. Could you suggest any procedure to determine the cause if due to endocrine disturbance other than basal metabolism, which I plan to get? Please omit name and address. M.D., Ohio.

ANSWER.—The first procedure, which is obviously being planned, is to determine the basal metabolic rate. The clinical symptoms mentioned in the query point to the thyroid rather than to any of the other endocrine glands, and they should be helped by thyroid therapy. It is possible, though not certain, that other tests may later be indicated, such as x-ray examination of the pituitary, blood sugar determination and sugar tolerance tests.

URETHRITIS WITH PHOSPHATURIA

To the Editor:—I have under my care at present a man, aged 25, who is suffering from a chronic urethritis. He has a persistent phosphaturia. He has been receiving fairly large doses of sodium acid phosphate with no help. Will you kindly let me know the significance of this condition and also any suggestions you may have for its treatment?

MILOSH KASICH, M.D., New York.

ANSWER.—There is considerable difference of opinion as to the clinical significance of phosphaturia. Although some urologists believe that it can be the cause of irritation, in the majority of cases its finding is of no clinical importance. It is doubtful whether phosphaturia alone is ever the cause of chronic urethritis. It is conceivable that precipitated phosphatic material might cause some irritation of an inflamed urethra, but hardly sufficient to produce a discharge. The persisting urethritis is probably due either to infection in the prostate gland and seminal vesicles, a stricture, or a follicular infection in the urethra.

The coincidence of phosphaturia and chronic urethritis is not uncommon. Patients occasionally are observed with both these conditions who become well following acidification of the urine. However, it has not been proved that overcoming phosphatic precipitation in the urine by acidification is necessarily the factor that aids the urethritis. In acidifying the urine it is advisable to keep a record of the hydrogen ion concentration in order to determine the efficacy of medication employed. It is well known that acidification of the urine frequently has an inhibitory effect on bacterial growth and that infection sometimes may be overcome by this comparatively simple procedure. In order to prevent bacterial growth it is necessary that the p_H of the urine be brought down at least to a level of 5.4. Precipitation of phosphatic crystals usually occurs when the p_H is no longer neutral or is slightly alkaline, and slight acidification, with a p_H less than 6, will usually cause phosphatic crystals to disappear. For the purpose of acidifying the urine, ammonium chloride given in enteric coated tablets will be found to be more efficacious than acid sodium phosphate.

IMMUNITY OF NEW-BORN TO RESPIRATORY INFECTIONS

To the Editor:—Please comment about the immunity of the new-born to respiratory infections. I am more interested in susceptibility of the new-born and infant to infections of the upper respiratory tract—the common cold, rhinitis, nasopharyngitis, tonsillitis, otitis media, bronchitis—than to the pneumonias. Is the new-born infant slightly susceptible or even susceptible at all to any of the respiratory infections? Comment briefly about the loss of natural immunity to respiratory infections as age advances. M.D., Texas.

ANSWER.—The new-born and the young infant seem to enjoy at least a relative immunity to infections of the upper respiratory tract. It has been observed that the incidence of such infections is four times greater at the twelfth month than at the third. Infants who have passed their first six months seem more susceptible to infections of the upper respiratory tract than those of the previous age period. This immunity in the young infant can be explained only by the assumption that antibodies in variable quantity are present in the body of the infant. The mother probably confers immunity to the infant. The best objective example of this early natural immunity is shown by the Schick test for diphtheria. In the first few months of life it is negative in 85 per cent of the cases. Toward the end of the first year the immunity has diminished so much that the Schick test is negative in only 10 per cent of the cases examined. On clinical grounds alone one would assume that the same degree of immunity holds good for diseases of the upper respiratory tract, though in the latter group the point cannot be proved as in the case of the susceptibility to diphtheria by use of the Schick test.

There are other factors, such as the vague expression "the child's constitutional state." It appears that some children are better antibody producers than others. It has been observed that infants who appear fairly well developed and not debilitated by previous disease or nutritional disturbance may nevertheless show a markedly diminished immunity against infection. This applies to infections of the upper respiratory tract as well as to other infectious processes that attack young infants.

The season of the year also seems to affect the incidence of infections of the upper respiratory tract. Every clinician knows that infections and the high mortality rate and complications resulting from them are greater during the winter months than during the warmer season of the year. While these facts of seasonal variation are well known, nevertheless it is difficult to offer an adequate explanation.

The nutritional status of the infant is an important contributing factor in establishing his immunity to infections of the upper respiratory tract. In healthy babies intercurrent infections of the upper respiratory tract take a moderate and short

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course, whereas in those who have been improperly fed or have previously suffered from alimentary disorders the course is more protracted and severe. In a breast-fed infant, as a rule, there is greater resistance to infection, and if it does occur it runs a milder course.

A well balanced, well regulated diet tends to produce an optimal state of immunity. In the case of the artificially fed infant this obviously refers to the correct quantity and quality of the various food substances, properly balanced. It has been stated, and it is probably correct to say, that the vitamins A, B, C and D not only play an important part in nutrition but also tend to increase the immunity of the infant against infections, including disorders of the upper respiratory tract.

So far as the loss of natural immunity in respiratory infections with advancing age is concerned, one can only say that in addition to the loss of natural immunity there are such external factors as overcrowding in ill ventilated homes or institutions, exposure to infections, and the effect of cold and chilling on the body surface. We must also consider the increase in susceptibility to allergic factors, such as food, pollen and dust-laden air, animal emanations, and a host of other things that tend to cause allergic response. Nowhere are these reactions more marked than in the mucous membranes of the upper respiratory tract.

URTICARIA

To the Editor:—A white man, aged 44, married, a farmer, complains of hives, which first appeared about three years ago and are present from the beginning of fall through spring. The hives usually appear while he is in the house and disappear sometime after he goes outside. The rest of the history, the physical examination, urinalysis and blood count are negative. The patient was found to be sensitive by intradermal test to cattle hair, horse hair, wheat, potatoes and milk. Elimination of foods containing the latter three articles from his diet was of no avail and the patient cannot change his occupation, in which he comes in close contact with both cattle and horses. A course of antigen for desensitization was given and the hives became smaller, did not last as long and did not itch as severely as before the treatment. However, they occur as frequently as before. I am now giving the patient the continuation vial for continued treatment. Can you give me any suggestion as to further treatment? Please omit name and city.

M.D., Illinois.

ANSWER.—It is suggested that the injections already started be continued for perhaps a month or two. In addition, it would be wise to try systematic elimination diets, irrespective of the skin tests. It is well known that in most cases of urticaria skin tests are not successful, as they are either positive with no clinical basis or negative to foods that really do bring on the attacks. In only about 25 per cent of instances (the figures vary with different workers) do the skin tests in urticaria correlate with the clinical observations. The percentage of positive skin tests in hay fever is about 95, in bronchial asthma perhaps 75.

Elimination diets may be carried out in several ways. One method is to eliminate one set of foods at a time; for example, all meats are forbidden for one week; then all fish; then fruits, vegetables, spices, nuts, cereals, eggs, milk, and so on during successive weeks. Another way is to start with milk and cream alone for two or three days and then add one food at a time. A third way is based on such diets as prescribed by Rowe in his book on food allergy. These diets are numbered 1, 2 and 3 and the patients are given those foods which are least likely to cause the urticaria. Eggs, wheat and milk are the most common offenders and are therefore kept out of the diet until all other foods have been tried. A record of changes in diet should be kept and from four to seven days should be required to see whether adding or subtracting a food has any clinical effect.

While most cases of urticaria are due to foods, some come from contact with certain substances, particularly silk, horse hair, wool and certain dyes used in garments. These contacts should be looked into. Removal of a hair mattress has cleared up some cases. Substitution of rayon for silk has helped others. Drugs too may be responsible, as many cases have followed the use of such coal tar products as acetylsalicylic acid or aminopyrine. Quinine, barbiturates and other drugs have also caused trouble. Drugs are more apt to cause angioneurotic edema than ordinary urticaria. It would be wise to stop the use of all drugs if any are being given.

Other methods of treatment for urticaria may be tried. Autohemotherapy is favored by some: withdraw 10 cc. of blood from an arm vein and inject the blood at once intramuscularly into the buttocks. Vaccines have been tried; calcium by mouth or intravenously and thyroid extract have been used. Most of these are only fairly successful, if at all. It is, of course, necessary to build up the patient's resistance as much as possible and to have him avoid all things that make him more "nervous" and therefore more susceptible to pruritus.

EFFECTS OF TUBERCULIN AND FOCAL REACTIONS

To the Editor:—Having diagnosed pulmonary tuberculosis in a youth, aged 19 years, I thought I had better have the sputum of all the members of the family tested as well as do the intradermal tuberculin test on all. On inserting the needle intradermally in the forearm of the brother (20 years of age) I noticed the solution shoot out from the needle where it joins the bulb. No wheal was raised; hence I sterilized another needle and proceeded to do the intradermal injection about 1 inch above the other point of injection. This was done on Saturday at 3 p. m. Sunday at 10 a. m. the patient returned complaining of a lump in the axilla. Around both points of injection was a flat area of erythema about one-half inch in circumference. The swelling in the axilla was soft and probably was an axillary gland inflamed. The patient complained of chilly sensations but had no fever. What worries me is: Did I give too much tuberculin unknowingly (New York Board of Health tuberculin) with a severe reaction? Did I inadvertently inject contaminating pyogenic organisms? Does the axillary enlargement indicate an existing tuberculous disease (rather than infection)? The chest has been negative. If the axillary swelling begins to fluctuate would you suggest incision and drainage or aspiration?

HENRY ROSNER, M.D., Brooklyn.

ANSWER.—It does not seem probable that the axillary swelling was due to tuberculin, since such a short time elapsed between its administration and recognition of the swelling. Usually there is little or no reaction even at the site of injection in less than twenty-four hours. It would also seem unlikely that pyogenic micro-organisms introduced so recently would result in the axillary condition. The development in the axilla is probably a coincidence or was preexistent rather than the result of tuberculin. If the swelling proves to be due to involvement of an axillary lymph node and fluctuation is elicited, aspiration may suffice. Examination of the aspirated material by smears, cultures and animal inoculation should aid in the final diagnosis.

Large doses of tuberculin introduced subcutaneously may cause focal reaction; that is, at the site of an area of disease some inflammation appears. In the case of superficial lymph nodes, such as those of the axillary group, enlargement and tenderness may be experienced. However, if the standard initial dose of tuberculin was used and even if all of both injections was introduced intracutaneously, it is most unlikely that such a reaction would result.

PREGNANCY IN HEART DISEASE

To the Editor:—A white woman, aged 24, married, had rheumatic fever at 6 but no subsequent attacks. Cardiac residuals consisted of chiefly aortic insufficiency (the mitral valve seems to be intact). The heart is fairly well compensated. The patient has no dyspnea or cyanosis but occasionally suffers "pseudo-anginal" pains, lasting several hours and occurring only when she is at rest. No headaches occur, she is rarely dizzy, and she has no fainting spells. An appendectomy has been done and one ovary was removed for a cystic condition. She stood the operations well. What do statistics show as to the length of life in such cases? The patient is desirous of having a child. Should she be permitted to do so? Kindly withhold name.

M.D., New York.

ANSWER.—It is of the utmost importance in answering this query to know how much aortic insufficiency there is, how big the heart is, what the blood pressure levels are (both systolic and diastolic), the site of the pseudo-anginal pain, and whether or not it is simply the heart ache of neurocirculatory asthenia, as it probably is.

Assuming that the mitral valve is normal or at least not deformed to any appreciable degree, the following prognosis and suggestions may be made for each of three degrees of aortic regurgitation:

1. For very slight aortic regurgitation in which the heart will be little if at all enlarged and the blood pressure normal or but slightly changed, the prognosis will probably be good for many years to come, and in the absence of recurrent rheumatic infection or subacute bacterial endocarditis the patient may live the full length of life and go through several pregnancies with safety.

2. If the aortic regurgitation is of moderate degree with slight to moderate cardiac enlargement and a fairly full pulse, but not one of full blown water hammer character, the prognosis will not be so favorable. Life will probably continue for a number of years, but it seems likely that heart failure and death may occur sometime between ten and twenty years from now, other things being equal. It may be all right to allow such a patient to go through one pregnancy carefully watched.

3. In a patient with a high degree of aortic regurgitation, a much enlarged heart, and a water hammer pulse, a very full pulse pressure (such as with a systolic blood pressure of 140 or 150 and a diastolic pressure of 20 or 30), the prognosis is unfavorable, and it is possible that the patient may succumb in the next ten years from heart failure, from extension of the

heart disease or from subacute bacterial endocarditis. Such a patient should not be allowed to go through pregnancy.

If at the present time there is real angina pectoris or any evidence of congestive failure, the prognosis is still more unfavorable and the duration of life the matter of a few years at best.

OTOSCLEROSIS

To the Editor:—I am 47 years old. Twenty years ago I discovered that I was not hearing as well as I should. From then on deafness has descended on me till now I find it a great burden in my life as a general practitioner. Some say it is otosclerosis and others nerve deafness. Probably it is both. The high notes are especially bad. I use a telephone aid and a Western Electric hearing aid. My hearing is much better in a moving auto and in a dance hall I can hear better than most of my partners; in fact, for a few hours while dancing I am in a new world with the blight of deafness removed. Is there not some clue for relief in the fact that my hearing is better in the circumstances mentioned? Is there anything you can recommend to help or at least to prevent further progress of this deafness? Is there any use in going to one of the great clinics for examination or treatment? I can manage if I do not get worse. Please omit name and address.

M.D., Manitoba.

ANSWER.—From the description given, this is probably a case of otosclerosis in which there is also involvement of the cochlea, so that the high tones also are affected. Many patients with otosclerosis have the so-called paracusis Willisii, in that they apparently hear better in a noisy environment. This is probably due to the fact that the otosclerotic patient does not hear the low tones, whereas the hearing individual who is conversing with him is masked for low tones by the surrounding noises and therefore raises his voice in intensity so that the individual with impaired hearing can better understand. He therefore thinks he is hearing better in a noise. If a thorough examination of the hearing function has been made, there would be no object in repeated examinations so far as a guide to treatment is concerned, for unfortunately there are no therapeutic measures that are of any avail in otosclerosis. On the other hand, if the bone conduction is normal or prolonged, the individual is often greatly benefited by the use of an electrical hearing aid, particularly one that has an attachment for application to the bone of the mastoid region.

SEPTICEMIA AFTER ABORTION

To the Editor:—I have a patient who has developed a septicemia following incomplete abortion. Would you please give me information on the treatment of septicemia? This patient has a red cell count of 4,950,000, a hemoglobin of 70 per cent and a white cell count of 10,500. She feels quite well except for the chills, and she is taking nourishment quite well. She has a severe headache, beginning just before and continuing through the duration of the chill. A chill lasts about fifteen minutes. This condition developed about two weeks after the abortion started. She states that intervention was not done and I have reason to believe that she has done nothing to bring on abortion. Please omit name.

M.D., North Dakota.

ANSWER.—From the history of the case it does not appear certain that the patient has a septicemia. Nearly always when septicemia occurs in a case of incomplete abortion the infection starts within a few days following the abortion. Furthermore, this patient's subjective symptoms apparently are not disturbing except for the chills. Another unusual occurrence in this case is the normal red blood count, white blood count and hemoglobin. Nearly always in cases of septicemia there is a secondary anemia and a definite leukocytosis. No information is given concerning the temperature, the urinary examination and blood cultures. The history of a late onset of chills in this case should make one suspect pyelitis or thrombophlebitis. A catheterized specimen of urine should be obtained and it should be examined microscopically.

Treatment in this case should be along general lines. The patient should have abundant fresh air and ample sunlight. She should be given large quantities of fluids and fruit juices. If the urine contains many pus cells, large amounts of alkali should be given for a few days and then large amounts of acid should be given instead. Solution of posterior pituitary, 0.5 cc. three times a day, helps in some cases. If the uterus is not well involuted, a half teaspoonful of fluid extract of ergot should be given by mouth four times a day for a few days. Nourishing food, of course, should be given. Attention should be paid to the bowels and bladder. If the patient cannot sleep sedatives should be given. The only indication for intrauterine manipulation is hemorrhage that cannot readily be controlled by ergot and pituitary extract. Even if septicemia is definitely present there is no specific therapy. In some cases antistreptococcus serum is of distinct help. Large amounts of alcohol in the form of wine help others. Blood transfusions in amounts between 250 and 300 cc. are of great benefit even in cases in which there is not much anemia.

HAY FEVER RESORTS IN MAINE

To the Editor:—I should like information regarding a good hay fever resort in Maine. The resort will have to be near a point where the patient could have hospital facilities if necessary and medical care.

EDWARD C. ALBERS, M.D., Champaign, Ill.

ANSWER.—Any city in the vicinity of the Rangeley Lakes in the northern end of Maine will be found satisfactory for a ragweed hay fever sufferer. Calais, Fort Fairfield and Houlton, in Aroostook County have first-class hospital service. The latter place has two hospitals. It is advisable to avoid the Maine coast unless perhaps at Eastport, where the ragweed pollen concentration is less than at other points on the coast. The total pollen count for Eastport in 1935 was 280. There were only four days on which the pollen count exceeded 25 granules per cubic yard of air. The count at Upper Dam in the Rangeley Lakes area was 165, with only one day above 25. Conditions in northern Maine are even better than at Upper Dam.

MAPHARSEN IN SYPHILIS

To the Editor:—A carpenter, aged 42, weighing 160 pounds (73 Kg.), incapacitated for a month to six weeks because of what he thought to be rheumatism complicated by measles, seen June 13, 1935, had a typical secondary papular syphiloderm with a four plus Wassermann reaction. The eruption had appeared from two and a half to three weeks previously. He had been exposed (at which time gonorrhea also was contracted) in March, which was a full three months earlier. Examination revealed a penile scar chancre, which had been treated locally, edema of the foreskin, and a gonorrheal discharge. The vascular and renal systems and the eyes were normal. No positive neurologic signs were found. It was decided to place the patient on the therapeutic regimen outlined by the League of Nations Committee of Experts (THE JOURNAL, April 13, 1935, p. 1329). The patient could be seen only once a week, so the arsenical chosen was mapharsen, 0.06 Gm. being used in all but the initial dose. The bismuth preparation used was bismuth salicylate in oil, 2 grains (0.13 Gm.). Potassium iodide was given by mouth during the bismuth courses. To date the following has been given. Eight injections of mapharsen followed by four weekly injections of the bismuth preparation, then six injections of mapharsen, and I have just finished the sixth and last dose of the second course of the bismuth preparation. The serologic reactions after both arsenical courses and the first bismuth course is Wassermann four plus and Kahn three plus. A spinal fluid examination at this time revealed the Wassermann reaction two plus, globulin slightly increased, and colloidal gold 3332211000. The clinical response to treatment has been excellent, the patient being able to resume work after the second dose of the arsenic preparation. At present he states that he feels better than he has in ten years. Aside from the original dose of mapharsen, when a marked Herxheimer reaction occurred, all treatment has been very well tolerated. There are no neurologic changes. Please advise whether I am justified in carrying out the plan of treatment I have started or should this be altered in any way. Would tryparsamide be a better arsenical to use in this case in view of the spinal fluid examination and if so how would it fit into the scheme of treatment? Please omit name and address.

M.D., Kansas.

ANSWER.—Mapharsen is a trivalent arsenical compound, chemically meta-aminoparahydroxyphenylarsine oxide, which has been recently tested out in experimental trypanosomiasis and human syphilis. The first report by Foerster and his associates made on the basis of a clinical study on eighty patients treated with 2,117 injections of the drug indicated that mapharsen was a potent antisyphilitic agent and that further clinical trial was justified. In nearly all the cases of early syphilis the Wassermann reaction of the blood serum was reversed to negative. Return to a positive reaction occurred in half the cases and was found to be associated in five with abnormalities in the spinal fluid. The drug was well tolerated by nearly all the patients in properly adjusted dosage. Mild gastro-intestinal symptoms occurred in some, jaundice developed in four cases, and renal symptoms were observed in four others. Other observers have also had the impression that the clinical results were comparable with those of the arsphenamines. The value of mapharsen in neurosyphilis cases is still undecided and for the present Lorenz and Bleckwenn, who have used the drug for more than two years, state that it is not to be recommended in these cases. As the spinal fluid in the present instance is positive, it would seem to be wiser to substitute tryparsamide with proper visual control. Courses of tryparsamide should alternate with heavy metal therapy in the effort to obtain a reversal of the positive spinal fluid. The following references should be consulted:

Foerster, O. H.; McIntosh, R. L.; Wieder, L. M.; Foerster, H. R., and Cooper, G. A.: Mapharsen in the Treatment of Syphilis: A Preliminary Report, *Arch. Dermat. & Syph.* **32**: 868 (Dec.) 1935.

Grubzit, O. M.: Mapharsen ("Arsenoxide") in the Therapy of Experimental Syphilis and Trypanosomiasis, *Arch. Dermat. & Syph.* **32**: 848 (Dec.) 1935.

Mapharsen stands accepted by the Council on Pharmacy and Chemistry of the American Medical Association (THE JOURNAL, January 18, p. 214).

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RECTAL GONORRHEA

To the Editor:—I have under my care a woman of 30 who for the past year has complained of vague abdominal pains and a daily rise in temperature of low-grade type, 99 to 100, with no increase in pulse and no loss in weight. The external physical examination is negative; the blood Kahn reaction is entirely negative. The urine is normal. Cervical smear is positive for gonococci, for which I have been treating her for five weeks. Recently I made a proctoscopic examination and found the rectal mucosa to be very hyperemic, and it bled on the least manipulation. At the upper pole of the rectum I discovered what appeared to be free pus, with no apparent sac. On gram stain, I found intracellular gram-negative diplococci, identical with the gonococci. Now this is apparently a case of rectal gonorrhea also. I should like to know whether the rectal condition could be responsible for the abdominal pains (mild gnawing sensation). The pelvic examination revealed free adnexa. Also, is there a standard accepted method of treatment for rectal gonorrhea? How could the gonococcus gain access to the rectum, unless during the act of wiping while at stool? There is no history of perverted intercourse. Please omit name.

M.D., Illinois.

ANSWER.—Perverted sexual intercourse is a frequent cause of gonorrheal proctitis. It is difficult and often impossible to obtain a history of perversion, particularly if this has occurred but once. It may also occur in women who have been infected with gonorrhea and who are careless about their personal hygiene. Infected enema points have been held responsible in some instances. In some cases it may be quite impossible to determine the method of infection.

Gonorrheal infection of the rectum rarely causes gnawing sensations in the abdomen, and in a situation of this kind one should look elsewhere for the cause of abdominal pain. In some of the cases there are no symptoms and in others there is a sensation of burning and smarting, as well as tenesmus.

Treatment is best carried out by rectal irrigations with silver nitrate in the strength of 1:2,000. The solution should be made up with water free of chlorine. Application of silver nitrate in the strength of 1 or 2 per cent is very effective. If the silver nitrate produces too much irritation, one may use preparations such as strong protein silver, 5 per cent, or mild protein silver, 5 per cent.

INOCULATION AGAINST TYPHOID IN MAN AND RABIES IN DOGS

To the Editor:—As the family and I have traveled widely each summer for many years, we have taken an immunizing series against typhoid and paratyphoid every four years. Is it necessary to continue doing this indefinitely or have we probably developed a permanent immunity by now? If possible, I should like an answer to another question, not strictly medical, but it seems to me rather important. A year ago we adopted a dog and had him get an immunization against rabies. The veterinary surgeon who gave it said that it should be repeated annually. Can you tell me whether that is necessary or was he merely looking for an annual fee? I think all dog lovers should be informed on this point and would greatly appreciate an answer if you can give it.

ROBERT W. SHEARMAN, M.D., Brooklyn.

ANSWER.—Unquestionably the injections of vaccine will have produced a degree of immunity. It is conceivable, however, that a massive infection might overwhelm the resistance and consequently it might be safer to repeat the immunization if the exposure to infection seems dangerous.

The single inoculation of antirabic virus used for dogs confers immunity probably in many instances not exceeding a year. There have been some failures noted in shorter periods. It is a good precaution, therefore, to have the dog immunized each year.

PATHOLOGY OF OPIUM ADDICTION

To the Editor:—What is known to date of the blood chemistry and tissue pathology, gross and microscopic, of chronic opium addiction? Needless to say we in China are in constant contact with this, and I am interested in fitting our treatments to the needs with the hope that better results may follow.

FREDERICK G. SCOVEL, M.D., Tsining, Shantung, China.

ANSWER.—Blood chemistry in chronic opium poisoning when individuals are stabilized on their drug of addiction is set forth in the volume "Opium Addiction," published by the American Medical Association in 1929-1930. The volume consists of a reprint of articles by various authors reporting on studies conducted by the "Philadelphia Committee for the Clinical Study of Opium Addiction (Archives of Internal Medicine, Volume 43-44)." These reports show the following to be normal: blood sedimentation rate, fragility of the red cells, clotting time, viscosity of whole blood, oxygen content, red cell count, white cell count, differential and hemoglobin, cell volume, Wassermann reaction (subsequent experiences have shown that in some instances the blood Wassermann and Kahn reactions have shown differences during addiction and following withdrawal), specific gravity of blood and plasma, plasma refractive index, dry matter of the blood and plasma, plasma p_H, carbon dioxide capacity of the plasma, serum conductivity, blood sugar, blood urea, creatinine and uric acid, blood chloride, blood calcium, and blood magnesium.

The accepted blood changes that take place during the abstinence period of addiction are blood concentration, leukocytosis, hyperglycemia, hyperlacticacidemia, and decrease in inorganic phosphorus content of the plasma, and slight rise in blood cholesterol, in unrelated form.

OBSTRUCTION OF CERVIX

To the Editor:—A woman, aged 35, was curetted in the fall of 1932 for the frequent passing of blood and accompanying pain. A diagnosis of endometrial hyperplasia was made at that time. She was completely relieved for a period of three months, when the old symptoms reappeared and, in addition, at each period a terrific odor appears and remains for about two days following cessation of the period. The period is of four days' duration, with few clots, and moderate in amount. Between periods she occasionally has pain in the lower quadrants of the abdomen and passes small gobs of blood. She has been to several clinics without relief. She has taken courses of theelin, amniotin, and so on, without relief. Smears are negative. Hanging drop smears are negative and there are no vaginal irritations, signs or symptoms. There is no other body change. What is the most plausible diagnosis? Would another curettage be advisable? Is there a possibility of a sponge having been left in the uterus? The uterus, tubes and ovaries appear normal to digital examination. Please do not publish my name.

M.D., Minnesota.

ANSWER.—The absence of symptoms for three months following a diagnostic curettage, together with the clinical picture related, indicates possible obstruction in the cervix. Cervical strictures are relatively common and by their interference with the free flow of uterine secretions may give rise to the symptoms which the patient presents. A careful study of the cervical canal under anesthesia is in order, together with thorough dilation and curettage of the uterus.

It is unlikely that a foreign body was overlooked at the time of the previous curettage.

If, at operation, it should be proved that there is no cervical obstruction, the patient has hyperplasia of the endometrium as a result of dysfunction of the ovaries. The subsequent course will be most interesting.

FUNCTIONAL TIC

To the Editor:—A white woman, aged 45, complains of a muscular twitch in the back on the right side over an area corresponding to the rhomboideus major. This condition began in August 1932 and, while it has occasionally diminished in severity for a day or two at a time, it has been constant ever since. It has been severe enough at other times to retract the shoulder. The patient can control the "twitch" voluntarily by holding the muscles of the shoulder girdle taut. When they tire, the condition begins again. Moreover, as long as she is working, the "twitch" is not present. But relaxation, even for the shortest time, will immediately set the contraction in progress. Her main problem is sleeping. She lies in bed and is unable to sleep until the contractions stop, and she states that she is frequently awakened by them. There is no history of trauma. Physical examination is negative, and there are no significant observations in blood count, urine analysis or Wassermann reaction. She has been taking one-fourth grain (0.016 Gm.) of phenobarbital four times a day, which has not helped the situation much. These details are about all I can give. Please let me have your suggestions as to diagnosis and therapy. Kindly omit name.

M.D., New York.

ANSWER.—While this would be looked on as a case of functional "tic" analogous to spasmodic torticollis by those who consider the latter a "tic," it is more likely that the condition is disease of the lenticular nucleus or other part of the extrapyramidal motor system. Such disease might be primary "dystonia lenticularis" (dystonia musculorum progressiva), a sequel of unrecognized encephalitis, or possibly even early paralysis agitans. If phenobarbital has proved ineffective, scopolamine should be tried.

LOCAL ANESTHESIA FOR SURGERY ON PERITONSILLAR ABSCESS

To the Editor:—Will you please tell me the most satisfactory method of using local anesthesia for opening a peritonsillar abscess?

PAUL J. FLORY, M.D., Pawnee City, Neb.

ANSWER.—There is no really satisfactory method of anesthetizing the palate locally in order to open a peritonsillar abscess. There are a number of methods in use, all of them offering satisfactory results at times, but all of them have their defects. One can paint a fine streak with from 30 to 70 per cent phenol, making sure that the applicator is not dripping, in the line of the expected incision. Phenol, however, used in

this fashion may cause a little local necrosis. One may inject a solution of procaine and epinephrine. The objection to this is that it is surgically unsound to inject solutions into infected areas. Finally, one may use a curved cotton tipped applicator dipped in 10 per cent cocaine and passed along the floor of the nose backward until it rests on the nasopharyngeal aspect of the soft palate. Here the cocaine will rest on the nerves that go to supply the region involved and produce frequently enough a satisfactory anesthesia.

PLASTIC SURGERY OF NOSE

To the Editor:—Is it possible to pare down an anteriorly bowed nasal bone by approaching the operation from within the nasal cavity? The condition is a congenital one. If this is possible, what are the chances of dimpling of the skin at the back ridge of the nose as a complication? The patient, a girl, has a nose that appears in profile with an abnormal forward bowing of the ridge. Please omit name. M.D., Wisconsin.

ANSWER.—Convexity of the nasal bridge is usually congenital and may involve the bony or cartilaginous portion or both. The correction of this deformity is accomplished by an intranasal operation that leaves no visible scar or dimpling of the skin. The projecting portions of bone and cartilage are removed after the skin has been lifted and the profile is reduced to the desired level. It is usually necessary also in these cases to elevate the tip of the nose slightly in order to forestall the apparent lengthening that would result from merely removing the hump. It usually takes from ten days to two weeks for the postoperative swelling to disappear and the operation in no way impairs subsequent strength of the supporting structures.

FORMIC ACID BURNS OF HANDS

To the Editor:—I have a case of formic acid burns of both hands. Everything I know of has been tried to heal them. New blebs form after each dressing. These break down and form new ulcers. Have you any treatment to suggest? Please omit name. M.D., Massachusetts.

ANSWER.—Formic acid may burn and blister the skin with the subsequent development of keloids in some of the cases. When these burns occur, immediate free irrigation of the affected sites with a weak aqueous solution of sodium bicarbonate should be applied until all the acid is neutralized and the pain relieved. The areas may then be painted with a 3 per cent aqueous solution of gentian violet. If new blebs continue to form, it is well to continue frequent irrigation. The use of bland ointments is also of value to promote healing in some of these cases.

INFECTIOUS ADENITIS

To the Editor:—In THE JOURNAL, May 30, under Queries and Minor Notes there is a question headed "Infectious Adenitis or Mononucleosis," signed "M.D., Georgia." I would point out that the reply is incomplete, to say the least. The questioner has given a carefully detailed history which, in itself, would strongly suggest undulant fever. Adenitis is not a rare finding in brucellosis. All the laboratory data given would fit into the well established picture of undulant fever. The gradually rising white blood count with increase of lymphocytes at the expense of polymorphonuclear leukocytes is commonly seen in brucellosis. All other tests were negative. Agglutination occurred with Brucella abortus in a 1:20 dilution of the blood serum, late in the course of the illness—a usual finding in brucellosis. (This could be a cross agglutination of no significance.) Angle, Evans and others, including myself, have repeatedly pointed out that agglutination with Brucella abortus in a low dilution of blood serum is just as significant as agglutination in higher dilutions, in patients exhibiting a clinical picture of undulant fever. Finally, in the May 12, 1935, issue of THE JOURNAL, under Queries and Minor Notes, there is a question framed as follows: "In making a diagnosis of undulant fever in patients who show the clinical symptoms suggesting the disease, I should like to know how high the titer must be in the serologic test before the diagnosis can be safely made." In reply the following remarks appeared among others: "Diagnostic significance is usually attributed to agglutination in dilutions of 1:80 or above. It cannot be said, however, that there is any arbitrary diagnostic agglutination titer. While the serums of most individuals who exhibit a more or less well defined clinical picture of undulant fever will show agglutination in titers of 1:80 or above, occasional cases will be encountered in which no agglutinins are present or agglutinins will exist in titers of from 1:10 to 1:40. Ordinarily, serum agglutinins do not appear until a week or ten days after the onset of illness. In some cases however, agglutinins may not appear for several weeks."

In your reply should not undulant fever have been suggested at least as a possible diagnosis? In addition to the suggestion that an agglutination test with sheep's red cells be done, a blood culture for Brucella abortus might also have been suggested as well as further agglutination tests with Brucella abortus to detect a possible rising titer.

HAROLD J. HARRIS, M.D., Westport, N. Y.

Medical Examinations and Licensure

COMING EXAMINATIONS

STATE AND TERRITORIAL BOARDS

ALASKA: Juneau, Sept. 1. Sec., Dr. W. W. Council, Juneau.

ARKANSAS: *Basic Science.* Little Rock, Nov. 2. Sec., Mr. Louis E. Gebauer, 701 Main St., Little Rock. *Medical (Regular).* Little Rock, Nov. 10. Sec., Dr. A. S. Buchanan, Prescott. *Medical (Eclectic).* Little Rock, Nov. 10. Sec., Dr. Clarence H. Young, 207½ Main St., Little Rock.

CALIFORNIA: Los Angeles, July 20-23. Sec., Dr. Charles B. Pinkham, 420 State Office Bldg., Sacramento.

CONNECTICUT: *Basic Science.* New Haven, Oct. 10. *Prerequisite to license examination.* Address, State Board of Healing Arts, 1895 Yale Station, New Haven.

FLORIDA: Jacksonville, Nov. 16-17. Sec., Dr. William M. Rowlett, P. O. Box 786, Tampa.

GEORGIA: Atlanta, Oct. 13. Joint-Sec., State Examining Boards, Mr. R. C. Coleman, 111 State Capitol, Atlanta.

IDAHO: Boise, Oct. 6. Commissioner of Law Enforcement, Hon. Emmitt Pfost, 205 State House, Boise.

ILLINOIS: Chicago, Oct. 20-22. Superintendent of Registration, Department of Registration and Education, Mr. Homer J. Byrd, Springfield.

KENTUCKY: Louisville, Dec. 2-4. Sec., State Board of Health, Dr. A. T. McCormack, 532 W. Main St., Louisville.

MARYLAND: *Regular.* Baltimore, Dec. 8. Sec., Dr. John T. O'Mara, 1215 Cathedral St., Baltimore. *Homeopathic.* Baltimore, Dec. 8-9. Sec., Dr. John A. Evans, 612 W. 40th St., Baltimore.

MINNESOTA: *Basic Science.* Minneapolis, Oct. 6-7. Sec., Dr. J. Charnley McKinley, 126 Millard Hall, University of Minnesota, Minneapolis. *Medical.* Minneapolis, Oct. 20-22. Sec., Dr. Julian F. DuBois, 350 St. Peter St., St. Paul.

MONTANA: Helena, Oct. 6. Sec., Dr. S. A. Cooney, 7 W. 6th Ave., Helena.

NEW HAMPSHIRE: Concord, Sept. 10-11. Sec., Board of Registration in Medicine, Dr. Charles Duncan, State House, Concord.

NEW MEXICO: Santa Fe, Oct. 12-13. Sec., Dr. Le Grand Ward, Santa Fe.

NEW YORK: Albany, Buffalo, New York and Syracuse, Sept. 21-24. Chief, Professional Examinations Bureau, Mr. Herbert J. Hamilton, 315 Education Bldg., Albany.

OREGON: *Basic Science.* Portland, Nov. 21. Sec., Mr. Charles D. Byrne, University of Oregon, Eugene.

PUERTO RICO: San Juan, Sept. 1. Sec., Dr. O. Costa Mandry, Box 536, San Juan.

SOUTH DAKOTA: Rapid City, July 21-22. Dir., Division of Medical Licensure, Dr. Park B. Jenkins, Pierre.

VIRGINIA: Richmond, Dec. 9-13. Sec., Dr. J. W. Preston, 28½ Franklin Road, Roanoke.

WISCONSIN: *Reciprocity.* Madison, Sept. 8-9. Sec., Dr. Robert E. Flynn, 401 Main St., La Crosse. *Basic Science.* Madison, Sept. 26. Sec., Prof. Robert N. Bauer, 3414 W. Wisconsin Ave., Milwaukee.

NATIONAL BOARD OF MEDICAL EXAMINERS

NATIONAL BOARD OF MEDICAL EXAMINERS. *Parts I and II.* Sept. 14-16. Ex. Sec., Mr. Everett S. Elwood, 225 S. 15th St., Philadelphia.

SPECIAL BOARDS

AMERICAN BOARD OF DERMATOLOGY AND SYPHILOGY: Philadelphia, June. Sec., Dr. C. Guy Lane, 416 Marlboro St., Boston.

AMERICAN BOARD OF OBSTETRICS AND GYNECOLOGY: Written examination and case histories of Group B candidates will be held in various cities in the United States and Canada, Nov. 7. *Applications must be filed at least sixty days prior to the examination.* Sec., Dr. Paul Titus, 1015 Highland Bldg., Pittsburgh (6).

AMERICAN BOARD OF OPHTHALMOLOGY: New York, Sept. 26. *All applications and case reports must be filed sixty days before date of examination.* Sec., Dr. John Green, 3720 Washington Blvd., St. Louis.

AMERICAN BOARD OF ORTHOPAEDIC SURGERY: Cleveland, Jan. 9. Sec., Dr. Fremont A. Chandler, 180 N. Michigan Ave., Chicago.

AMERICAN BOARD OF OTOLARYNGOLOGY: New York, Sept. 25-26. Sec., Dr. W. P. Wherry, 1500 Medical Arts Bldg., Omaha.

AMERICAN BOARD OF PEDIATRICS: Baltimore and Cincinnati in November. Sec., Dr. C. A. Aldrich, 723 Elm St., Winnetka, Ill.

AMERICAN BOARD OF PSYCHIATRY AND NEUROLOGY: New York, Dec. 29-30. Sec., Dr. Walter Freeman, 1028 Connecticut Ave., Washington, D. C.

AMERICAN BOARD OF RADIOLOGY: Cleveland, Sept. 25-27. Sec., Dr. Byrl R. Kirklin, Mayo Clinic, Rochester, Minn.

Connecticut March Examination

Dr. Thomas P. Murdock, secretary, Connecticut Medical Examining Board, reports the written examination held in Hartford, March 10-11, 1936. The examination covered 9 subjects and included 70 questions. An average of 75 per cent was required to pass. Thirty-three candidates were examined, 21 of whom passed and 12 failed. The following schools were represented:

School	PASSED	Year Grad.	Per Cent
Yale University School of Medicine	(1933) 75,* (1934)		75*
George Washington University School of Medicine	(1935)		78.5
Georgetown University School of Medicine	(1935)	77.2,	78.5
Johns Hopkins University School of Medicine	(1934)		80*
University of Maryland School of Medicine and College of Physicians and Surgeons	(1935)		75

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Harvard University Medical School	(1933) 76.2, (1935)	77.2
Tufts College Medical School	(1935) 75, 78.4, 79, 81.1, 85.9	75.4,
Long Island College of Medicine	(1933)	75*
Temple University School of Medicine	(1935)	75
University of Pittsburgh School of Medicine	(1934)	75
Woman's Medical College of Pennsylvania	(1933)	77
Medical College of Virginia	(1935)	79.3
University of Dublin School of Physic, Trinity College	(1934)	77.5

School (FAILED)	Year Grad.	Per Cent
George Washington University School of Medicine	(1935) 71.6,	71.6
Georgetown University School of Med.	(1934) 73.5, (1935)	70.9
Boston University School of Medicine	(1934)	73.1
Tufts College Medical School	(1934) 67.1, (1935)	72.4
Jefferson Medical College of Philadelphia	(1934)	73.5
University of Montreal Faculty of Medicine	(1935)	68.2
Ludwig-Maximilians-Universität Medizinische Fakultat, München	(1934)	69.1
Regia Università degli Studi di Roma. Facoltà di Medicina e Chirurgia	(1933)	71
Osteopath		†

Fourteen physicians were successful in the examination for endorsement applicants given in New Haven, March 24. The following schools were represented:

School (PASSED)	Year Grad.	Endorsement of
Yale University School of Medicine	(1930),* (1932), (1933), (1934)	N.B.M.Ex.
School of Med. of the Division of the Biol. Sciences	(1933)	Ohio
University of Kansas School of Medicine	(1933)	N. B. M. Ex.
Johns Hopkins University School of Medicine	(1932)	Maryland
Columbia University College of Phys. and Surgs.	(1911)*	New York
Cornell University Medical College	(1931)	New York
Fordham University School of Medicine	(1919)*	N.B.M.Ex.
University of Oregon Medical School	(1931)*	N.B.M.Ex.
University of Vermont College of Medicine	(1931),* (1933)	N. B. M. Ex.
Ludwig-Maximilians-Universität Medizinische Fakultät, München	(1925)	New York

* License has not been issued.
† Average grade not reported. Examined in medicine and surgery.

Book Notices

Disease and Destiny. By Ralph H. Major, M.D. Preface by Logan Clendening, M.D. Cloth. Price, $3.50. Pp. 338, with 47 illustrations. New York & London: D. Appleton-Century Company, Inc., 1936.

Dr. Major's thesis is that disease whether affecting a single individual or great numbers of men may have a profound influence on subsequent events. The diphtheria that strangled George Washington, the smallpox that caused the death of Louis XV, the syphilis that wrecked the brain of Nietzsche had results as definite as had the bullet that took the life of Abraham Lincoln or the daggers that ended the career of Julius Caesar. The mass destruction of peoples by plague, malaria, yellow fever changed the history of cities or even of nations; at times the effects were world wide in extent. The diseases discussed by the author are familial hemophilia and nine parasitic diseases—plague, typhus, tuberculosis, smallpox, diphtheria, malaria, leprosy, yellow fever and syphilis. Dr. Major knows his subject. He is a practitioner, teacher, investigator, and an ardent student of the history of medicine. He is not satisfied to be a compiler at second hand; he goes to original sources. His wanderlust has impelled him to travel in the Old World, as in the New, not alone the familiar routes of the tourist. His joy is to turn aside to visit less known places, to explore the narrow street, to enter the house or the very room where some celebrity lived or died; to seek out in the library some faded manuscript or rare first edition, or to study or photograph some forgotten but significant painting. It is the result of these excursions into by-paths that gives to the book the feature of human interest that always makes such a strong appeal to readers. The author has not intended to write an encyclopedic work; far otherwise. The stories of malaria and yellow fever, for example, are by no means complete. But they convey much of information and attract one by their thumbnail sketches of Laveran, Ronald Ross, Finlay, Walter Reed, Gorgas. These men stand out as living personalities and not as conventional contributors of dry facts. Possibly one might criticize the writer for at times letting his enthusiasm lead him to describe individuals or their topical setting in such detail as to get him rather far away from his main theme; i. e., disease and its influence on destiny. That Ross was a poet and a mathematician of note has a remote bearing on the question of malaria. Yet we are glad Dr. Major wrote as he did, rather informally or even discursively, for it makes the reading of his pages a refreshing pleasure. All physicians, whether general practitioners or specialists, even well informed medical historians, will enjoy the book. The layman should find it attractive and illuminating. The author clearly had them in mind as he wrote and with a higher purpose than merely to please. There is not one of the chapters that does not convey an implied or frankly expressed lesson—the value of research in laboratory and at the bedside; the necessity for vivisection and of necropsy if scientific medical progress is to be made; the importance of preventive medicine and of public health activities; the nature of rational treatment of disease. Cults, pure empiricism, blind adherence to dogmatism and tradition find little comfort here. Altogether one must put on the book the stamp of emphatic approval. It deserves the success that was accorded Dr. Major's earlier volume "Classical Descriptions of Disease."

Les voies aériennes et la tuberculose. Par Georges Portmann, professeur de clinique oto-rhino-laryngologique à la Faculté de médecine de l'Université de Bordeaux, et Henri Retrouvey. Bibliothèque de phtisiologie, sous la direction de Léon Bernard. Paper. Price, 50 francs. Pp. 312, with 30 illustrations. Paris: Masson & Cie, 1936.

This excellent book is one of a monograph series on tuberculosis, the Bibliothèque de phtisiologie, edited by the late Léon Bernard. According to the authors the purpose of this monograph is to relate and discuss the clinical aspects, the problems and the diagnosis of tuberculous lesions of the upper air passages, in connection with their relations with pulmonary tuberculosis. Chapters are added on nontuberculous infections of the nasal sinuses, nasal deformities that have a bearing on respiration, foreign bodies in the air passages, and hemoptysis that can originate in nontuberculous conditions in the upper respiratory tract. Four excellent roentgenograms of the accessory sinuses are reproduced, and the associated conditions of sinusitis and bronchitis, which gave so much difficulty in the differential diagnosis of pulmonary tuberculosis during the World War, are well described. All forms of tuberculous lesions of the nose, pharynx, trachea and larynx are carefully described. Pictures portraying tuberculous laryngitis from the earliest myopathic form to the late perichondritis are admirable. The pathology of the tuberculous lesions is discussed and the lymphatic and hematogenous routes of these complications of pulmonary tuberculosis are carefully criticized, as well as direct infection from sputum. The distribution of the cervical lymph nodes is given a full page illustration. Climatic treatment, rest treatment and the effect of pulmonary collapse therapy on the upper respiratory tuberculous lesions are all matters thoroughly presented. A case is related of Vernieuwe's in which alcohol injection into the recurrent laryngeal nerve of the left side for serious ulceration with edema produced a paralysis of the cord for three months and resulted in cure. The case is referred to as one of "collapsothérapie hémilaryngée." One is surprised to find under general therapy that gold and rare earth salts have been found of benefit in certain upper respiratory lesions. Emil Bogen in a comprehensive study of the effects of all elements on tuberculosis found no favorable effect from cerium and most unfavorable results from beryllium in his work on guinea-pigs. In clinics for tuberculosis in this country, more and more emphasis is being placed on the use of the bronchoscope in patients when collapse therapy has not succeeded in making the sputum negative or when hemoptysis persists in spite of collapse therapy. Not only have tuberculous lesions in the trachea been found in such patients, but also ulcers in the bronchi which have yielded to local treatment. These matters will probably be given more stress in subsequent editions. It is a charming characteristic of the French to honor distinguished physicians. In this well written work one finds such terminology as "the disease of Brindel," "the malignant tuberculous pharyngitis of Letulle," "the acute miliary tuberculous pharynx of Isambert," "the subacute miliary tuberculous pharynx of Escat" and "le bacille de Koch" for the tubercle bacillus. The bibliography contains about 250 references and is compiled from the actual publications to which the authors had access.

Emergency Surgery. By Hamilton Bailey, F.R.C.S., Surgeon, Royal Northern Hospital, London. Second edition. Fabrikoid. Price, $14. Pp. 842, with 812 illustrations. Baltimore: William Wood & Company, 1936.

This work has been thoroughly revised and rewritten. The introductory chapters are on intravenous infusion, blood transfusion and anesthesia. Emphasis is placed on the necessity for the surgeon to be trained to meet any emergency. The treatment of general peritonitis is taken up from the point of first determining the cause. Cecostomy has proved of value. Operation for acute perforated appendicitis is not usually attempted after fifty hours except when there is general peritonitis, in children, after a cathartic and when one is in doubt as to the diagnosis. Urgent operations for various conditions in the abdomen, including the viscera and the intestine, are taken up first as to the diagnosis and then as to the proper treatment. The technic of operations for hernia and on the female pelvis are included. A comprehensive survey is given of the genitourinary organs. Emergency conditions are discussed rather briefly as they affect the thorax, spine, head, face, neck, bones, joints and extremities. A good section is that on hand infections. Acute infections and burns are included. Chapters on the eye and ear are written by collaborators, the field of general surgery being the work of the author. The clear and practical advice given over such a large field conclusively demonstrates an extensive experience. It is with pleasure that one reads the methods and particularly the indications for operation by a master surgeon. To the younger man in search of well seasoned advice the volume should prove invaluable.

Exploration radiologique des colons et de l'appendice au moyen des solutions floculantes. Images de muqueuses: Technique, séméiologie, syndromes. Par Georges Maingot, électro-radiologiste de l'Hôpital Laënnec, Raymond Sarasin, et Henri Duclos, assistant de radiologie à l'Hôpital Laënnec. Travail du service de radiologie de l'Hôpital Laënnec. Préface de Antoine Béclère, membre de l'Académie de médecine. Cloth. Price, 200 francs. Pp. 229, with 203 illustrations. Paris: Masson & Cie, 1935.

According to the preface, this is the composite work of three roentgenologists, who were not given special introduction because of their apparent eminence in France. The book describes a method of examining the colon and appendix by means of a colloidal solution of thorium oxide. Essentially the technic consists of an injection of the opaque medium and the examination of the colon first under pressure, secondly after elimination and thirdly after the injection of air. The modus operandi is attributed to the precipitation of the colloidal material on the mucosa of the bowel. In the first part of the procedure one develops the usual routine picture, in the second part the bowel appears as a network of interlacing lines that are attributed to the folds of the mucosa outlined by the precipitated thorium, and in the third part the distended bowel takes on a spotted appearance as the result of the separation of the precipitated thorium. Any departure from the normal is thus demonstrated, particularly in the second and third parts of the routine. Disturbances in the intricate pattern of the mucosal relief are easily seen and in the third portion the pathologic lesions become outlined because they interrupt the snowstorm pattern. The book is excellently printed and a great number of illustrations, some of which appear to be retouched, are shown describing the various pathologic lesions. This combined effort is a worthy contribution to a field that is already well filled. The method of presentation is clear and easily read.

Basal Metabolism in Health and Disease. By Eugene F. Du Bois, M.D., Medical Director, Russell Sage Institute of Pathology, New York. Third edition. Cloth. Price, $5. Pp. 494, with 98 illustrations. Philadelphia: Lea & Febiger, 1936.

In this edition Professor Du Bois's book has been almost entirely rewritten and much new material added. It is a remarkable book in that all the valuable literature on the subject, both scientific and clinical, is presented together with the extensive calorimetric investigation carried out under his direction in the Russell Sage Institute of Pathology in an interesting and exhaustive manner. Du Bois has succeeded in his aim "to bring basal metabolism out of the realm of pure physiology into the domain of clinical medicine" and in doing this has made the book of the greatest value to the clinician and general practitioner. The work is indispensable to all research workers in the field of metabolism. The book, as before, is divided into two parts. Part I, on metabolism in health, is enriched by a more ample discussion of the mechanism of the loss of heat from the body in which for the first time the subject of radiation is accurately presented in an understandable manner. This chapter will be of particular value to modern heating and ventilating engineers, as it opens up the possibility of developing new methods of heating rooms. The chapters on the biologic significance of the surface area and on normal standards have been clarified and enlarged by full discussion of the recent publications on these subjects including the studies of Boothby, Berkson and Dunn, which have not yet been printed. Part II, on metabolism in disease, has been enriched by a careful review and discussion of the vast literature on the subject that has appeared in recent years. It is this part which renders the book indispensable to the clinician and general practitioner.

The Specificity of Serological Reactions. By Karl Landsteiner, M.D., The Rockefeller Institute for Medical Research, New York. Cloth. Price, $4. Pp. 178. Springfield, Illinois, & Baltimore: Charles C. Thomas, 1936.

The review (THE JOURNAL, March 24, 1934, p. 958) of the original edition in German (Landsteiner, Karl: Die Spezifizität der serologischen Reaktionen, Berlin, Julius Springer, 1933) is repeated here because it describes clearly the purpose and character of the book: "The purpose of this monograph is to summarize the results of the work of the author and his co-workers on antigens and to discuss serologic specificness and related questions. As would be expected from the leader in the chemical study of specificness, attention centers mainly on chemical work bearing on fundamental problems. The presentation follows essentially the development of this work. There is an introductory statement of the concept of specificness, which is followed by sections on the serologic specificness of proteins, on the specificness of cellular antigens, on the specificness of the antibodies, on serologic reactions with artificial antigenic complexes and simple chemical substances, and on chemical investigations of specific cell substances (carbohydrates, lipoids). The author is a master of clear, concise, correct statement. His method of reviewing published work is a model of exactness and concrete precision. Not a word is wasted. Landsteiner's monograph is a classical contribution. It should be translated into English." The present edition in English follows the plan of the German original; only such changes have been made as were necessary to incorporate into the text the significant new facts that have come to light in the meantime. No elaboration of the earlier review need be attempted, but it may be permitted to say that the book is of exceptional merit and deserves fully the praise bestowed on its predecessor.

Elektrokardiographische Befunde bei Herzinfarkt. Von Anton Jervell, 1. Assistent. Acta Medica Scandinavica, Supplementum LXVIII. Paper. Pp. 267, with 74 illustrations. Oslo: Kirstes Boktrykkerl, 1935.

This well written monograph, in German, is a detailed presentation of the electrocardiographic observations in sixty-six clinically diagnosed cases of myocardial infarction in sixty-five unselected patients, observed from 1931 to 1935. Serial curves, frequently numerous, were recorded in fifty-seven instances. There are additional serial records of other conditions showing graphic alterations that simulate infarction. These, with diagrams of infarct localization as determined by necropsy, furnish an abundance of illustrations. A protocol of each case is included. There were forty-five men and twenty women in the series. ST interval displacement, a frequent early observation, persisted longest in the precordial lead. Progressive T wave changes were of T_1 type in thirty-five and of T_3 type in twenty-one instances. ST interval and T wave alteration, the most dependable diagnostic graphic change, occurred in forty-nine cases. The precordial lead revealed characteristic changes in twenty-six of the thirty-six instances in which it was employed. Extrasystoles occurred in thirty-four, supraventricular in nine, ventricular in twenty-three, both forms in two; auricular fibrillation or flutter in seven; paroxysmal auricular tachycardia in one; auriculoventricular dissociation in three; prolonged auriculoventricular conduction in three; sinoauricular block in one; sinus bradycardia with interference dissociation in one; bundle branch block in seven, of the com-

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mon type in six, of the uncommon type in one; arborization block in five; low voltage in fourteen; deep Q_3 in nineteen and deep Q_3 in five cases. Of these electrocardiographic changes, arborization block alone appeared to be of prognostic significance. Necropsy was performed in twenty-six instances. Of sixteen with anterior infarction, eleven presented curves of T_1 type and three showed arborization block, whereas in two the graphic changes were of indeterminate type. Of the remaining ten with posterior infarction, all showed graphic changes of T_3 type. The material is unusually well presented. The pertinent literature is discussed in a clear and logical manner. A carefully selected bibliography includes reports of all the significant work on the subject and gives full recognition to American contributions. The monograph is a valuable addition to our knowledge of myocardial infarction, of particular interest to the clinician.

Die Entstehungsursachen der Haffkrankheit in dem Zeitraum von 1924-1933 vom epidemiologischen Standpunkt. Von Dr. med. Friedrich Wolter, Leiter des Hamburgischen Forschungsinstituts für Epidemiologie. Auf Grund des von der Regierung in Königsberg i. Pr. zur Verfügung gestellten amtlichen Materials dargestellt. Kleine Hippokrates-Bücherl, Band VII. Herausgegeben von Prof. Dr. med. Kurt Klare-Scheldegg. Boards. Price, 4.50 marks. Pp. 56. Stuttgart & Leipzig: Hippokrates-Verlag GMBH, 1936.

Several "new diseases" have come into the circle of medical interest during the course of the last two decades; among them German investigators have studied a curious epidemic on the Baltic coast near Königsberg. The syndrome of this "Haffkrankheit" includes the sudden onset of muscle pain and spasm, involving chiefly the muscles of the trunk, together with rather characteristic urinary changes, including hematuria and albuminuria. The clinical course is one of repeated attacks, with ultimate progression to chronicity and involving finally severe degenerative changes in the kidney, the musculature and the heart, together with profound metabolic disturbances. The Germans have used the term "Haff disease" because of its regional appearance in the lower stretches of the small rivers leading to the sea in the region of Königsberg. Wolter, who is the director of the Hamburg Institute of Epidemiology, discusses the various etiologic possibilities and stresses particularly the meteorological conditions and the general relation of the appearance of this disease to the climatic cycles. He points out the similarity of the clinical picture to the "Bornholm disease" of Madsen. While of general interest to the epidemiologist, the monograph offers little that is concrete, and relatively much in the way of generalities.

Time of Ovulation in Woman: A Study on the Fertile Period in the Menstrual Cycle. By Carl G. Hartman, Department of Embryology, Carnegie Institution of Washington. Medical Aspects of Human Fertility Series Issued by the National Committee on Maternal Health, Inc. Cloth. Price, $3. Pp. 228, with 72 illustrations. Baltimore: Williams & Wilkins Company, 1936.

This little book, published under the auspices of the National Committee on Maternal Health, is a calm, concise and critical review of our knowledge concerning reproductive phenomena, especially as this bears on the correctness or incorrectness of the much discussed doctrine of a "safe period" of the cycle. Written as it is by a biologist whose life work has been in this field, its tone is in refreshing contrast to at least a good many of the scientific, lay and religious publications on this subject which have appeared in such profusion in the past few years. The author presents an excellent outline of reproductive physiology, paying especial attention to the question of the time of ovulation, a problem to which he himself has made important contributions. With reference to the Ogino-Knaus theory he concludes that "as the more objective and reliable proofs accumulate they show a trend decidedly toward a complete denial of ovulation in the last quarter of the cycle, i. e., toward the establishment of the Ogino-Knaus law. But thus far we cannot yet give this a final approval." The chief reason for this is the general unreliability of the available human data, largely because of the paucity of really accurate menstrual records. The format and typography are excellent and the style of writing simple and clear, so that, in spite of the complexity of some of the problems discussed, the book should be of value not only to the medical reader but also to the more intelligent and biologic-minded laywoman seeking information on this subject. A foreword has been contributed by Dr. R. L. Dickinson.

Hydrotherapy and Climatotherapy. By Matthew B. Ray, D.S.O., M.D., M.R.C.P., Senior Physician, The British Red Cross Clinic for Rheumatism, Peto Place, N.W. 1, London. With a foreword by The Right Hon. The Lord Horder, K.C.V.O., M.D., F.R.C.P. Cloth. Price, 12s. 6d. Pp. 312. London: Edward Arnold & Co., 1936.

The author has collected data concerning most of the important health resorts in the British Isles and Europe and some in Africa and Asia and presents in a clear and concise manner the hydrotherapeutic and climatological value attributed to each. A short discussion is given of the method of procedure at each resort, and the various diseases in which baths and favorable climatic conditions have proved helpful are mentioned. The subject matter is presented in an interesting and orderly manner so that the practitioner may readily determine which health resort is best suited to his patient's needs. The volume contains much new and useful information concerning the manner in which human physiologic function is influenced by the various hydrotherapeutic procedures in use today as well as the relationship of barometric and climatic conditions to health and disease. In Europe, where the population as well as the medical profession is definitely spa minded, this book should fill a distinct need. In this country the interest in our watering places and health resorts, at least as far as the medical profession is concerned, is of comparatively recent inception. A committee to investigate American spas has recently been appointed by the American Society for the Study and Control of the Rheumatic Diseases and it is to be hoped that Dr. Ray's book may serve as a pattern for a similar work on the spas of this country.

Synopsis of Clinical Laboratory Methods. By W. E. Bray, B.A., M.D., Professor of Clinical Pathology, University of Virginia. Cloth. Price, $3.75. Pp. 324, with 43 illustrations. St. Louis: C. V. Mosby Company, 1936.

In the words of the author as stated in the preface, "the object of this synopsis is to bring together in a small volume for ready reference the more recent information and the most frequently used methods of laboratory diagnosis." Dr. Bray has accomplished his purpose excellently. The book begins with a list of the various services and special cases and the tests and routines applied to each. Then follow well organized, well illustrated chapters on every division of laboratory work: urinalysis, blood chemistry, bacteriology and surgical pathology. Each begins with a brief discussion of general rules and procedures that apply to the subject under consideration. Next are the routine and special procedures. Each is given specifically; only reliable new methods and most of the more favored methods are included. The author states, when necessary, which methods are preferable for determining certain facts, and gives the relative reliability and significance of the procedures. The volume concludes with a list of indicators, stains, staining solutions, reagents, and the preparation of each, removal of laboratory stains, atomic weights, a table of equivalents and a table of normals. This brief but complete volume will be appreciated by laboratory technicians and physicians.

The Married Woman: A Practical Guide to Happy Marriage. By Gladys H. Groves and Robert A. Ross, M.D., F.A.C.S. Cloth. Price, $2.50. Pp. 278. New York: Greenberg, 1936.

Even in a span of ten years one can see a change in the books on marriage. Gone the moralistic, solemn sermon about the holiness of marriage. There is no more emphasis on the spiritual love and there is more talk about the real practical issues involved. This book deals with problems of marriage frankly and openly, with a good deal of emphasis on the intimate relationships of marriage. The question of sex in marriage is taken up in detail and the authors are not afraid to tackle some of the problems involved in the sex adjustment of the newly married couple. If anything, the book overemphasizes the physical relationships in marriage and in that sense it carries a definite message and a plea. One may wish for a more extensive discussion of the later years of married life and problems involved in the raising of children, which, of course, can easily take up another volume. On the whole the book is practical, intelligent and frank and can be safely recommended to young married people. The placing of the responsibility for sex adjustment on the woman is a rather new note in books of this type, being obviously a welcome change.

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Embalmers: State Board of Embalmers Liable for Unauthorized Acts.—The plaintiff, a licensed embalmer, was employed as manager and embalmer of the Oregon City Funeral Home. This concern applied to the state board of embalmers for a license to conduct its business. The board, as a condition precedent to the issuance of the license, required the funeral home to discharge the plaintiff and to agree not to reemploy him. The plaintiff sued the board for wrongful interference with his employment, and from a judgment in favor of the plaintiff the board appealed to the Supreme Court of Oregon.

The board contended, among other things, that it was a quasi-judicial body and as such was not civilly liable for acts done within the scope of the board's lawful jurisdiction. In passing on the application of the funeral home for a license, the board contended, it was acting within the scope of its authority. But, said the Supreme Court of Oregon, the board was authorized to issue, renew, suspend, revoke and refuse to issue or renew funeral directors' licenses. It was not authorized to require any applicant for a license to discharge an employee and to agree not to reemploy him. In making such a demand, the board was without any jurisdiction. In doing so, it did not merely exercise jurisdiction erroneously; it acted without any jurisdiction. In proposing to withhold the funeral director's license unless the plaintiff was permanently discharged, the board did not exercise any legal right. Having thus acted without any jurisdiction, the board, the court said, may be held civilly liable for injuries sustained by the plaintiff. The judgment for the plaintiff was consequently affirmed.—*De Marais v. Stricker (Ore.), 53 P. (2d) 715.*

Health Insurance: Postoperative Hernia and Inability to Follow a Gainful Occupation.—The defendant insurance company promised to pay certain benefits to the plaintiff if he became so disabled as to preclude him from following a gainful occupation. The plaintiff, who had always been a farmer and knew no other calling, owned a large plantation on which resided sharecroppers. In operating his farm he did considerable manual work, rode a horse, drove an automobile, operated a tractor, and actively supervised the work of his tenants. He underwent an operation for the removal of a ruptured appendix. About four months later, a large postoperative hernia developed. The insurance company paid benefits for more than a year and then stopped payments. The plaintiff then sued the company, and from an adverse judgment the insurance company appealed to the Supreme Court of Louisiana.

There was no conflict in the evidence concerning the inability of the plaintiff to perform strenuous labor, but the company contended, and produced testimony in support of the contention, that the plaintiff, with the aid of an abdominal support, could attend to his normal duties in connection with superintending the operation of the farm. On behalf of the plaintiff, however, witnesses testified that he was unable to ride a horse, drive an automobile or walk any considerable distance, and that any physical exertion might enlarge the hernia and cause strangulation of the intestine. The plaintiff himself testified that such activity as he had been able to engage in resulted in exhaustion, extreme nervousness, nausea, headaches, and gallbladder disturbances.

The general rule, said the Supreme Court, is thus stated in 14 Ruling Case Law 1315:

> . . . total disability contemplated by an accident insurance policy does not mean . . . a state of absolute helplessness which can result only from loss of reason. . . . On the contrary . . . "total disability" . . . is inability to do substantially all the material acts necessary to the prosecution of the insured's business or occupation in substantially his customary and usual manner.

In the opinion of the court, the evidence was overwhelming that the plaintiff was totally and permanently disabled from operating his farm in the same manner in which he did before the appendectomy, and the court could not bring itself in disagreement with the finding of the trial court that the plaintiff was incapable of riding a horse or driving an automobile for the length of time required of a superintendent of a farm to perform his duties without discomfort, pain, and danger to his health and life. Furthermore, the court said, the refusal of the plaintiff to submit to an operation to relieve the hernia did not justify the insurance company in refusing to pay him the benefits. The suggested operation, the court said, would not only be dangerous to the plaintiff's life, but also there was no definite assurance that the hernia would not recur. In the opinion of the court, the plaintiff should not be compelled to submit to an operation or else forfeit his right to disability instalments, because it was obvious that such an operation would seriously endanger his life. The judgment of the trial court for the plaintiff was therefore affirmed.—*Boughton v. Mutual Life Ins. Co. of New York (La.), 165 So. 140.*

Workmen's Compensation Acts.—Epilepsy Attributed to Trauma.—The worker, a young man who, according to the evidence, had always been well and strong, fell and struck his head against an iron radiator. He was unconscious for some hours. About a month later he developed symptoms of epilepsy and grew progressively worse. Attributing the epilepsy to the fall, he instituted proceedings under the workmen's compensation act of Tennessee and the trial court rendered judgment in his favor. The employer then appealed to the Supreme Court of Tennessee.

The employer contended that the epilepsy caused rather than resulted from the fall. The evidence, said the Supreme Court, did not sustain this contention. The employee testified that he fell when the chair in which he was sitting in a leaning position slipped from under him. There was evidence that he had never before had any head injury or shown any symptoms of epilepsy. Expert witnesses testified that the epilepsy may have resulted from the fall and the incidental brain injury. When, said the Supreme Court, a well man, with no history suggestive of brain disease, suffers a severe head injury and later develops brain trouble, without other or intervening apparent cause, the lay mind reasonably connects the affliction with the injury; and, when medical experts testify that such result may follow from such an injury, the causal chain is essentially complete. The judgment in favor of the worker was affirmed.—*Sears-Roebuck & Co. v. Finney (Tenn.), 89 S. W. (2d) 749.*

Optometry: Corporate Practice of Optometry Illegal in New Jersey—The supreme court of New Jersey, in denying a writ of mandamus to compel the secretary of state to file the petitioners' certificate of incorporation to "engage in the practice of optometry, through duly registered licensed optometrists in its employ," held that a corporation is incapable of practicing optometry in New Jersey. Statutory provisions in this state, said the court, provide for the issuance of a license to practice optometry only to those who have met certain qualifications, and corporations cannot possess those qualifications. The legislature never intended, said the court, the creation of a corporation to do that which the law permits the individual alone to do.—*Teseschi v. Mathis, Secretary of State (N. J.), 183 A. 146.*

Society Proceedings

COMING MEETINGS

American Congress of Physical Therapy, New York, Sept. 8-11. Dr. Nathan H. Polmer, 921 Canal Street, New Orleans, Secretary.
Colorado State Medical Society, Glenwood Springs, Sept. 9-12. Mr. Harvey T. Sethman, 1612 Tremont Place, Denver, Executive Secretary.
Idaho State Medical Association, Boise, Aug. 31-Sept. 4. Dr. Harold W. Stone, 105 North Eighth St., Boise, Secretary.
National Medical Association, Philadelphia, Aug. 16-22. Dr. W. Harry Barnes, 1315 North 15th St., Philadelphia, Acting Secretary.
Northern Minnesota Medical Association, Fergus Falls, Aug. 31-Sept. 1. Dr. Oscar O. Larsen, Detroit Lakes, Secretary.
Washington State Medical Association, Yakima, Aug. 31-Sept. 2. Dr. Vernon W. Spickard, 1303 Fourth Avenue, Seattle, Secretary.
Wisconsin, State Medical Society of, Madison, Sept. 8-11. Mr. J. G. Crownhart, 119 East Washington Avenue, Madison, Secretary.
Wyoming State Medical Society, Cody, Aug. 24-25. Dr. Earl Whedon, 50 North Main Street, Sheridan, Secretary.

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Current Medical Literature

AMERICAN

The Association library lends periodicals to Fellows of the Association and to individual subscribers in continental United States and Canada for a period of three days. Periodicals are available from 1926 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 12 cents if two periodicals are requested). Periodicals published by the American Medical Association are not available for lending but may be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

American Journal of Medical Sciences, Philadelphia

191: 597-740 (May) 1936

Treatment of Pernicious Anemia with Intramuscular Injections of Highly Concentrated Solution of Liver Extract. W. P. Murphy, Boston.—p. 597.

*Experimental Radium Poisoning: I. Bone Marrow and Lymph Node Changes in Rabbits, Produced by Oral Administration of Radium Sulfate. M. Rosenthal and E. J. Grace, Brooklyn.—p. 607.

Tetralogy of Fallot (Eisemenger Type) with Hypoplasia of Dextroposed Aorta. J. E. Talley and K. Fowler, Philadelphia.—p. 618.

Coarctation of Aorta with Intermittent Leakage of Congenital Cerebral Aneurysm: Report of Case. T. W. Baker and W. D. Shelden, Rochester, Minn.—p. 626.

Primary Pulmonary Arteriosclerosis with Polycythemia: Associated with Chronic Ingestion of Abnormally Large Quantities of Sodium Chloride (Halophagia). W. Darley, Denver, and C. A. Doan, Columbus, Ohio.—p. 633.

*Variations in Systolic Blood Pressure in Renal Tumor: Study of 491 Cases. C. G. Morlock and B. T. Horton, Rochester, Minn.—p. 647.

Dose of Antibody Effective in Treatment of Pneumococcus Type II Pneumonia. M. Finland, Boston, and H. F. Dowling, Washington, D. C.—p. 658.

Epidemic Pleurodynia: ("Devil's Grip") in Cincinnati. M. B. Welborn, Cincinnati.—p. 673.

Epidemic Myalgia or Pleurodynia in Southwestern Ohio. F. K. Harder, Cincinnati.—p. 678.

Rocky Mountain Spotted Fever in Pennsylvania. H. F. Flippin, Philadelphia.—p. 685.

Encephalomyelitis Following German Measles. H. H. Merritt and Y. D. Koskoff, Boston.—p. 690.

Observations on Effect of Malaria on Wassermann Reaction. R. Wilson Jr. and S. L. Levin, Charleston, S. C.—p. 696.

Collapse Therapy for Tuberculosis in the Small Sanatorium. R. J. Hanna, Jackson, Mich.—p. 703.

Punch Drunk. E. J. Carroll Jr., Pittsburgh.—p. 706.

Recovery of Brucella Abortus from Stools of Healthy Carriers. J. D. Goldstein, W. W. Fox and C. M. Carpenter, Rochester, N. Y.—712.

Bone Marrow and Lymph Node Changes in Experimental Radium Poisoning.—Rosenthal and Grace reproduced in rabbits by the oral administration of radium sulfate the general features of radium poisoning as observed in human cases. Jaw necrosis, a characteristic of the early acute cases among radium dial painters, can be produced experimentally by radium alone without mesothorium. Striking changes are produced in the bone marrow, consisting of an early hyperplasia of the erythropoietic elements followed by a decreased maturation of the erythroblasts and the replacement of these elements by myelocytes. Finally this hyperplastic marrow is replaced by fibrous tissue. In the lymph nodes there is noted an initial stimulation of the stem cells with subsequent damage to these cells resulting in depletion and atrophy of the lymphoid tissue. In the circulating blood an absolute lymphopenia is found. The development of myeloid tissue in lymph nodes and spleen associated with the extreme myelocytic hyperplasia in the marrow of the animals suggests that the occurrence of leukemia in x-ray and radium workers may not be a pure coincidence.

Systolic Blood Pressure in Renal Tumor.—Morlock and Horton studied the alterations of the blood pressures of 491 persons having renal tumors. In 459 cases there was a record of the preoperative systolic blood pressure, in 335 of which a pathologic diagnosis of renal adenocarcinoma of the hypernephroma type was made; 247 of the patients were males and eighty-eight females. Of this group of males 60 per cent had a normal blood pressure between 100 and 139 mm. of mercury, 0.8 per cent had definite hypotension, that is, a systolic pressure less than 100, and 39.2 per cent had hypertension, that is, a systolic pressure of 140 or more. When the actual readings of blood pressure were plotted and the arithmetical mean of the different age groups was superimposed in the form of a curve, it was found that this closely approached the curve obtained by a similar analysis of a large series of normal males, being perhaps slightly but hardly significantly elevated above the normal value. The blood pressure, taken from a few days to several years postoperatively, was recorded for eighty-one of the males who had hypernephroma. The mean values of these readings closely approximated the mean for normal males. In the eighty-eight females with hypernephromas the mean value was found to approximate closely that obtained by a similar analysis of normal females, although it is consistently slightly higher. The postoperative blood pressure was recorded in seventeen of these cases. Eight of the patients had a postoperative reading between 100 and 139, and nine had a reading of 140 or more. That the incidence for the different ranges of blood pressure was practically unaltered by removal of the tumor seems to the authors to be significant. The mean preoperative systolic blood pressure for the males with hypernephroma was 136, for the females 145. Though these values are admittedly elevated over those considered normal, if it is considered that this is due to the pressor action of a substance secreted by the hypernephroma there is no explanation why removal of the tumor does not consistently result in a lowering of the blood pressure. That such a drop does not occur is evident, in that the mean postoperative value for the blood pressure of males and females who had hypernephroma is 133 and 144, respectively. There were seventy-six males with renal tumors other than hypernephromas, 59.2 per cent having a systolic blood pressure between 100 and 139, and 40.8 per cent a systolic blood pressure of 140 or more. The arithmetical mean for this group closely approximated the normal. A postoperative record of the blood pressure was obtained in twenty-four cases; 66.7 per cent had a reading between 100 and 139, 8.3 per cent a reading less than 100, and 25 per cent a reading of 140 or more. There were forty-eight females with renal tumors other than hypernephromas; 45.8 per cent of these had a systolic blood pressure between 100 and 139, and 54.2 per cent of 140 or more. The arithmetical mean blood pressure also closely approaches the normal value. In twenty cases in which a postoperative record was made, 40 per cent of the patients had a blood pressure between 100 and 139, and 60 per cent of 140 or more. Of six cases of hypernephroma in which a definite involvement of the adrenals was proved, a marked hypertension was present in only two.

American Review of Tuberculosis, New York

33: 585-732 (May) 1936

*Rôle of Chronic Vitamin C Deficiency in Pathogenesis of Tuberculosis in Guinea-Pig. M. R. Greene, M. Steiner and B. Kramer, New York.—p. 585.

Effects of Intravenous Injections of Lecithin on Tuberculosis in Rabbit. Edna H. Tompkins, Nashville, Tenn.—p. 625.

*Mechanics and Biology of Tuberculous Cavities. P. N. Coryllos, New York.—p. 639.

Teaching of Tuberculosis at the University of California Medical School. E. Rosencrantz, San Francisco.—p. 661.

Studies on Behavior of Tubercle Bacilli Within the Body: I. Fate of Virulent and Avirulent Tubercle Bacilli Injected Intracutaneously into Normal Animals. H. J. Corper and M. L. Cohn, Denver.—p. 679.

Id.: II. Fate of Virulent and Avirulent Tubercle Bacilli Injected Intracutaneously into Immune Previously Inoculated Guinea-Pigs. H. J. Corper, M. L. Cohn and A. P. Damerow, Denver.—p. 694.

Id.: III. Local Cutaneous Reaction to Virulent Tubercle Bacilli in Guinea-Pigs. H. J. Corper, A. P. Damerow and M. L. Cohn, Denver.—p. 701.

Id.: IV. Cutaneous Reaction to Avirulent Tubercle Bacilli and Immunity. H. J. Corper, M. L. Cohn and A. P. Damerow, Denver.—p. 709.

Id.: V. Effect of Inoculation of Avirulent Tubercle Bacilli on Subsequent Virulent Infection in Animals. H. J. Corper, A. P. Damerow and M. L. Cohn, Denver.—p. 721.

Vitamin C Deficiency and Tuberculosis in Guinea-Pig.—Greene and his co-workers found that chronic vitamin C deficiency combined with a progressive tuberculous infection causes a significant shortening of the survival period and a significant decrease in the body weight of guinea-pigs. Chronic scurvy did not cause the development of generalized tuberculosis in animals infected with the relatively avirulent strain R1. Generalized tuberculosis develops more rapidly in chronically vitamin C deficient animals than in nonscorbutic animals infected by the subcutaneous or enteric route with strain H37 or tuberculous sputum. Guinea-pigs maintained on a partially

depleted vitamin C diet develop more lesions and ulcers in the intestinal tract than do animals on a complete diet when fed tubercle bacilli. When infected tuberculous sputum is fed, the extent and severity of the tuberculosis in the intestinal tract is greater than when pure cultures of tubercle bacilli are administered. Animals infected with tuberculosis and allowed to develop acute scurvy show no more tuberculosis than the control guinea-pigs.

Mechanics and Biology of Tuberculous Cavities.—Coryllos presents clinical, experimental and pathologic data which he believes cannot leave any doubt on the paramount importance of the bronchial outlets of tuberculous cavities in the evolution and the fate of the latter. The mechanism of the changes occurring in these cavities from their formation to their closure is regulated by the physiologic functions of gas exchange and gas absorption of the lung. The cure of the disease, or rather its change from progressive and active to arrested and inactive, is based on the biologic needs of the tubercle bacillus of large amounts of oxygen for life and growth. The development of fibrosis in the diseased lung is simply caused by the anoxemia that follows atelectasis and ischemia of the diseased parenchyma.

Annals of Medical History, New York

8: 185-276 (May) 1936

William Withering and Introduction of Digitalis into Medical Practice. L. H. Roddis, Washington, D. C.—p. 185.
Jean Devèze (1753-1826?): Notes on Yellow Fever Epidemic at Philadelphia in 1793. J. E. Lane, New Haven, Conn.—p. 202.
Obstetric Art at St. Peter's in Rome. R. E. Schlueter, St. Louis.—p. 227.
Pre-Columbian Peruvian Tibia Exhibiting Syphilitic (?) Periostitis, with Recognizable Varieties of Bone Marrow Cells. E. B. Krumbhaar, Philadelphia.—p. 232.
Syphilis and the Characters in Ibsen's Dramas. J. V. Klauder, Philadelphia.—p. 236.
Ancient Chinese Medicine. R. Charr, Philadelphia.—p. 242.
Medical Lore in Shakespeare. E. M. Watson, London, Ont.—p. 249.

Archives of Surgery, Chicago

32: 747-914 (May) 1936

*Evaporation of Water from Superficial Burns. G. S. McClure, Rochester, N. Y.—p. 747.
Conservative and Radical Measures for Treatment of Ulcer of Leg: II. Critical Study of Healing in Experimental and Human Wounds Under Elastic Adhesive Plaster. B. Douglas, Nashville, Tenn.—p. 756.
*Shock: Mechanism of Death Following Intestinal Obstruction. V. H. Moon and D. R. Morgan, Philadelphia.—p. 776.
Regional Ileitis. H. Koster, L. P. Kasman and W. Sheinfeld, Brooklyn.—p. 789.
Effect of Inflammation on Epiphyses. R. A. Y. Johnston, London, Ont.—p. 810.
Pubic Bones and Their Symphysis. C. J. Sutro, New York.—p. 823.
*Survival of Autoplastic Parathyroid Transplant in Patient Without Parathyroid Deficiency. P. Shambaugh and E. C. Cutler, Boston.—p. 842.
*Arthroscopic Examination of Knee Joint: Report of Cases Observed in Course of Arthroscopic Examination, Including Instances of Sarcoid and Multiple Polypoid Fibromatosis. M. S. Burman and L. Mayer, New York.—p. 846.
Site of Benign Giant Cell Tumor Eleven Years After Operation. W. F. Beswick and A. Brunschwig, Chicago.—p. 875.
Paralytic Dislocation of Hip. H. Milch and H. H. Green, New York.—p. 880.
Treatment of Gastrojejunocolic Fistula by Multiple Stage Operations. F. M. Findlay, Santa Barbara, Calif.—p. 896.
Hepatic Trauma: Analysis of Sixty Cases. E. G. Krieg, Detroit.—p. 907.

Evaporation of Water from Superficial Burns.—McClure measured rates of evaporation in thirteen cases of first and second degree burns, two cases of frost-bite, four cases of experimental burns produced by ultraviolet radiation and two cases in which tannic acid was applied to normal skin. It was found that evaporation has a negligible effect in producing dehydration after a severe burn. Even in children, evaporation alone could not be important. Increased concentration of the blood, such as was found by Underhill and others, can hardly be due ordinarily to loss of water from the body. This is confirmed by the constancy of the body weight during convalescence from burns. Hence water that leaves the blood probably remains in the body, in the spaces in various tissues. Restoration of the normal distribution of fluid, then, depends on vascular and other readjustments within the body. Treatment of burns with tannic acid reduces evaporation enormously, but the belief that the beneficial effects of tannic acid are due to the prevention of loss of water from the body is not supported by the data now available. Whatever water and protein are lost from circulation appear to remain largely within the body.

Shock: Mechanism of Death Following Intestinal Obstruction.—Moon and Morgan point out that the shock syndrome arises whenever there is a serious disparity between the volume of blood and the volume capacity of the vascular system. Such a disparity may develop from a decreased volume of blood, from an increased volume capacity of the vascular system or from combinations of these. In human patients with shock and in animals with experimentally induced shock there is visible postmortem evidence of an increased volume capacity of the vascular system. Evidence of this is seen in the edema of mucosae, in the effusions of serum into cavities lined with serous membrane and pulmonary alveoli and in the numerous capillary hemorrhages occurring in mucous and serous surfaces and in the parenchyma of organs. When capillaries are injured, by whatever means, the permeability of their walls is increased. When permeability of the capillaries is increased in extensive areas, the transudation of plasma through their walls causes edema in the tissues and increases the concentration of the blood. The dilated capillaries and venules are filled with viscid concentrated blood, and the heart is unable to maintain normal blood pressure because of insufficient return of blood from the periphery. As the circulation becomes ineffective, lack of oxygen contributes to further capillary atony, and the circulatory disturbance becomes more grave. If lowered blood volume and hemoconcentration are produced by plasmapheresis without injury to the capillaries, the animal may return to normal spontaneously or following the therapeutic administration of fluid. In shock, fluids are neither absorbed nor retained. Injection of them into the blood merely increases the edema. It appears that an essential factor by which shock develops and progresses is increased permeability of the capillaries. The hemoconcentration accompanying intestinal obstruction has been assigned to loss of fluid by vomiting. Such fluid comes from the blood, largely because of permeability of the capillaries. The combined effect of loss of blood volume by transudation and of increased volume capacity due to atony of capillaries and venules produces a circulatory insufficiency which manifests itself in the shock syndrome.

Survival of Autoplastic Parathyroid Transplant.—Shambaugh and Cutler have clinically corroborated that parathyroid autografts will survive regardless of the physiologic need of the organism for parathyroid tissue. They assumed that in their patient the anatomic deficiency in parathyroid tissue at the time the graft was placed was 50 per cent. As far as can be determined, however, there was no physiologic deficiency. The patient showed no evidence of tetany at any time, and the calcium content of the blood did not fall postoperatively. In fact, there was a slight rise from the preoperative level of 11.2 to 11.5 mg. per hundred cubic centimeters ten days after operation and 11.8 mg. fourteen days after operation. A final determination seven weeks after operation showed the calcium content to be 10 mg. A coincidental observation was that the patient had Paget's disease of the bone involving the right ilium and, to a slight extent, the skull. This probably does not signify a parathyroid deficiency and therefore does not alter the conclusion that the parathyroid autograft survived in the absence of an urgent specific physiologic demand.

Arthroscopic Examination of Knee Joint.—In their arthroscopic examination of eighty knee joints, Burman and Mayer encountered nine meriting individual report. In a case of sarcoid of the tendon sheath and joint, no cutaneous evidence of sarcoid was presented at any time. There was no splenomegaly, but a roentgenogram of the lungs showed hilar adenopathy. Microscopically, the changes are not incompatible with those observed in tuberculosis, and a study of each tubercle would have invariably led to a diagnosis of tuberculosis. A case of synovitis of the knee joint was characterized by bodies resembling Hassall corpuscles in the synovia. Their third case, a multiple polypoid fibromatosis of the synovia of the knee joint, clinically resembles nonspecific synovitis of the knee, with recurrent effusion. There is some resemblance to tuberculosis, which condition must be considered in the differential diagnosis.

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It is a true tumor of the knee. They encountered two cases of chronic nonspecific synovitis of the knee joint in young patients. The involvement is usually bilateral and is characterized by the presence of repeated effusions within the knee joint, with thickening of the synovial lining. Aspiration may diminish the effusion temporarily, but there is a marked tendency for rapid recurrence. Only the knee joint is involved, and no definite cause can be invoked. Trauma is apparently coincidental. The reaction to tuberculin is negative, and no signs of syphilis are present. The Wassermann reaction of the blood and of fluid from the joint is negative. It is always necessary to rule out a specific lesion, although the clinical behavior of the knee joints in these cases resembles that of syphilis more than that of tuberculosis. The disease process is seen to be confined to the synovia. In the sixth case, one of osteochondritis dissecans, the cartilage showed hypercellularity of the superficial layers and some localized thickening of the perichondrium. The synovia showed some villous hypertrophy and was the seat of chronic synovitis. Two cases of solitary intra-articular lipoma of the knee joint were observed. This is an uncommon tumor of the knee joint, the primary clinical importance of which lies in the fact that it acts as a mechanical block to motion, producing repeated temporary locking. It is the authors' opinion that the solitary lipoma arises in the presence of other diseases of the synovia and that it is such synovial irritation which rarely allows a synovial villus to proliferate so that a true lipoma is formed. While a history of direct trauma may be obtained, it is most likely that the trauma came about either coincidentally or as a result of the interposition of the tumor between the bony surfaces of the joint. Treatment consists in the removal of the tumor. The tumor should be transfixed by two needles just before the synovia is entered; otherwise, it may be difficult to locate it properly. The ultimate fate of the joint rests on the coincident pathologic process in the joint. The last case was one of sympathetic synovitis of the knee joint arising from an adjacent (absess of tibia) bony focus. Without actual arthrotomy, the effusion within the knee seems to have been due to the subjacent bony focus, a sympathetic synovitis. This condition has occurred in many cases of juxta-articular lesions, including fracture, infection and tumor. Yet it was imperative here to rule out an actual lesion of the knee, and this was done by arthroscopic visualization.

Journal of Biological Chemistry, Baltimore

114: 1-356 (May) 1936. Partial Index

Studies in Histochemistry: VII. Concentration of Vitamin C in Thymus in Relation to Its Histologic Changes at Different Stages of Development and Regression. D. Glick and G. R. Biskind, San Francisco. —p. 1.

Fatty Acids of Chrysalis Oil. W. Bergmann, New Haven, Conn.—p. 27.

Preparation of Gonadotropic Hormone of Pregnant Mare Blood. E. L. Gustus, R. K. Meyer and O. R. Woods, Kalamazoo, Mich.—p. 59.

Influence of Milk Constituents on Effectiveness of Vitamin D. G. C. Supplee, S. Ansbacher, R. C. Bender and G. E. Flanigan, Bainbridge, N. Y.—p. 95.

*Relationship Between Total and Free Cholesterol in Human Blood Serum. W. M. Sperry, New York.—p. 125.

Colorimetric Method for Determination of Inorganic Sulfate in Serum and Urine. T. V. Letonoff and J. G. Reinhold, Philadelphia.—p. 147.

Iron Content and Oxygen Capacity of Blood. Martha Johnson and M. E. Hanke, Chicago.—p. 157.

Metabolism of Sulfur: XXIII. Influence of Ingestion of Cystine, Cysteine and Methionine on Excretion of Cystine in Cystinuria. H. B. Lewis, B. H. Brown and Florence R. White, Ann Arbor, Mich.—p. 171.

Action of Various Reagents on Insulin. H. Jensen, E. A. Evans Jr., W. D. Pennington and Ellen D. Schock, Baltimore.—p. 199.

Serum Lipid Changes in Relation to Intermediary Metabolism of Fat. A. E. Hansen, W. R. Wilson and H. H. Williams, New Haven, Conn. —p. 209.

Extraction of Blood Lipids. E. M. Boyd, Kingston, Ont.—p. 223.

Iron and Copper Content of Milk Throughout the Season, as Related to Anemia Development in Rats. W. E. Krauss and R. G. Washburn, Wooster, Ohio.—p. 247.

Accelerant Effect of α-Amino Acids on Activity of Bone Phosphatase. O. Bodansky, New York.—p. 273.

Inorganic Salts in Nutrition: Changes in Kidneys of Rats Fed Diet Poor in Inorganic Constituents. Pearl P. Swanson, Ames, Iowa; Clare A. Storvick and A. H. Smith, New Haven, Conn.—p. 309.

Determination of Iodine in Biologic Material: Note. Gladys J. Fashena and Virginia Trevorrow, New York.—p. 351.

Total and Free Cholesterol in Blood Serum.—Sperry determined the concentration of total and free cholesterol in 126 samples of blood serum from ninety-one healthy adults. The minimal amount of free in total cholesterol was 24.3 per cent, the maximum was 30.1 per cent and the average was 26.9 per cent, with a standard deviation of 1.4 per cent. The result leads to the conclusion that the percentage is far more constant than has been recognized by previous investigators, most of whom have reported much larger variations and a higher average. Support for this conclusion was obtained in the observation that a large proportion of samples taken post mortem from human beings who had died suddenly gave values in the same narrow range. Similar results were obtained in healthy children and in four fifths of a large series of determinations on diseased children. With few exceptions, values above 31 per cent were found only in the presence of infection or liver disease. The percentage of free in total cholesterol appears to be a physiologic constant that may be of considerable value in the study of cholesterol metabolism and in pathologic conditions.

Journal of Nervous and Mental Disease, New York

83: 505-644 (May) 1936

*Dietary Deficiencies as Etiologic Factor in Certain Neurologic Syndromes. O. C. Perkins, Brooklyn.—p. 505.

Disseminated Toxic Degenerative Encephalopathy (Disseminated Sclerosing Demyelination) Secondary to Extensive and Severe Burns. J. H. Globus and M. B. Bender, New York.—p. 518.

Psychopathology of Time. P. Schilder, New York.—p. 530.

Carcinomatosis of Meninges Simulating Pachymeningitis Haemorrhagica Interna: Report of Case. A. G. Dumas and L. E. Nolan, Minneapolis.—p. 547.

Comparative Physiologic, Psychologic and Psychiatric Study of Polyuric and Nonpolyuric Schizophrenic Patients. F. H. Sleeper and E. M. Jellinek, Worcester, Mass.—p. 557.

Dietary Deficiencies and Certain Neurologic Syndromes.—From the study of eighty-two cases in which multiple neuritis was a prominent clinical entity, and in many of which there were mental symptoms, Perkins found that digestive disturbances were quite constantly present. A logical explanation for the lack of intake, failure of proper digestion or assimilation could be found in nearly every case. The varieties of clinical syndromes closely approximated those seen in beriberi, pellagra and sprue, which are accepted as being due to a lack of one of the vitamin groups. The known pathologic condition of the nervous system in these syndromes compares favorably with that seen in the accepted deficiency diseases. Finally, there was the therapeutic test of improvement when the patients were placed on a high vitamin diet. The failure to ingest the required amount of vitamins for that particular individual, or the inability to digest or assimilate the vitamins ingested, is responsible for the neurologic syndromes presented by the patients. Since the syndromes offer both clinical and pathologic fragments of deficiency diseases which are accepted as being due to different vitamins, the author believes that in many instances the lack of more than one type of vitamin is responsible for the pathologic changes. Until this subject has been more thoroughly investigated, these patients should be treated with a full diet rich in vitamins, especially B_1 and B_2. Since there are many diseases of the central nervous system in which the pathologic changes are degenerative instead of inflammatory, and the etiology is unknown, a more thorough investigation of the action of dietary deficiency on nerve tissue may bring to light at least one factor in the cause of the disease.

New Orleans Medical and Surgical Journal

88: 669-732 (May) 1936

What Shall We Do To Be Saved? Presidential Address. H. W. Kostmayer, New Orleans.—p. 669.

Pathology of Sickle Cell Anemia. W. R. Mathews, Shreveport, La.—p. 671.

Intensive Radiation in Hyperthyroidism. S. C. Barrow, Shreveport, La. —p. 679.

Recent Diagnostic and Therapeutic Advances in Peripheral Circulatory Disease. J. R. Veal, New Orleans.—p. 682.

Hematuria. D. T. Milam, Monroe, La.—p. 690.

Tularemia: Study of Sixty-Nine Cases. J. M. Perret, New Orleans. —p. 694.

Increasing CaH for the Modern Treatment of Fractures of Spine. E. S. Hatch, New Orleans.—p. 702.

Dementia Praecox. H. R. Unsworth, New Orleans.—p. 707.

Treatment of Acute Head Injuries. R. M. Penick Jr., New Orleans. —p. 710.

Oklahoma State Medical Assn. Journal, McAlester

29: 117-156 (April) 1936

Society and Scientific Medicine. G. R. Osborn, Tulsa.—p. 117.
Friendship in the Medical Profession. L. H. Ritzhaupt, Guthrie.—p. 121.
Achievements of Urology. A. R. Sugg, Ada.—p. 123.
Surgery: A Fine Art or a Technic? A. S. Risser, Blackwell.—p. 125.
Further Observations on Vitamin A Deficiency as Shown by Studies with Visual Photometer and Clinically. I. O. Park, Muskogee.—p. 129.

Radiology, Syracuse, N. Y.

26: 521-650 (May) 1936

Technic for Roentgenoscopic Examination of Stomach and Duodenum. B. R. Kirklin, Rochester, Minn.—p. 521.
Some Essential Considerations of Technic of Gastro-Intestinal Radiography. J. R. Carty and Vinita Merrill, New York.—p. 531.
Intravenous Urography in Children. M. Swick, New York.—p. 539.
Atypical Distribution of Pleural Effusions. L. G. Rigler, Minneapolis. —p. 543.
*Pulmonary Mycotic Infections. R. A. Carter, Los Angeles.—p. 551.
Primary Carcinoma of Lung. D. E. Ehrlich and H. A. Hauptman, New York.—p. 563.
Intrathoracic Tumors: Their Diagnosis and Treatment. S. Brown and J. E. McCarthy, Cincinnati.—p. 574.
*Influence of Roentgen Therapy on Basal Metabolism in Leukemia. W. S. Middleton, O. O. Meyer and E. A. Pohle, Madison, Wis.—p. 586.
Incidence of Peptic Ulcer Associated with Duodenal Stasis. J. Friedenwald and M. Feldman, Baltimore.—p. 595.
Duodenal Diverticula. A. S. Unger and M. H. Poppel, New York.—p. 601.
Mediastinal Tumors and Malignant Lymphoma. I. Arons, New York. —p. 605.
Construction of Roentgenkymographs and Kymoscopes. W. G. Scott and S. Moore, St. Louis.—p. 622.

Pulmonary Mycotic Infections.—Carter points out that pulmonary mycotic manifestations on the roentgenogram vary from case to case and from disease to disease but will simulate closely some manifestation of tuberculosis. On the whole, minority characteristics of tuberculosis are simulated. These are seen so much more frequently as tuberculosis that they are properly recognized as tuberculosis-like. However, they are definite mycotic predilections. With persistent failure to find the tubercle bacillus and with suggestive peculiarities of history, the chance of mycosis is sharply increased. Geographic location, occupation, associated extrapulmonary lesions or characteristics of the roentgenogram of the chest may direct suspicion to mycosis or to a particular disease, such as blastomycosis, coccidioides or actinomycosis. The accuracy of these deductions is immaterial so long as they promote the decisive bacteriologic investigation. Characteristics adding to the likelihood of a mycosis are: outstanding mediastinal or hilar adenopathy, miliary lesions associated in the adult with adenopathy, absence or sparsity of dry air-containing cavities in advanced lesions, extra prominent pleural lesions, absence of an obviously older apical or subapical lesion from which the remainder of the involvement may have spread bronchiogenically, growth of a consolidation by contiguous spread, lesions of bone or soft tissue abscess about the thorax, extension of involvement through the thoracic wall, hilar, truncal and peribronchial thickenings, bronchiectatic manifestations, fine discrete miliary or nodular manifestations associated with fine peribronchial accentuation, and cloudy parenchymal densities accompanying a subacute persistent respiratory attack. Only by detailed study of the original roentgenograms of known mycoses in volume can any degree of accuracy be attained in their roentgen diagnosis.

Influence of Roentgen Therapy on Basal Metabolism in Leukemia.—In spite of the overwhelming evidence of the prognostic value of basal metabolic determinations in leukemia and their application as a guide to roentgen therapy, Middleton and his associates have not found a wide clinical acceptance. Only five of the thirty-five leukemic subjects failed to show an elevation of the basal metabolic rate at the time of their study. Even this small minority might have been further reduced had the period of study in such instances been extended. One of these exceptions occurred among sixteen cases of myelocytic leukemia, as contrasted with four among eighteen cases of lymphocytic leukemia. The opportunity to follow the progress of leukemic patients under roentgen therapy by means of periodic or routine basal metabolic determinations was afforded in twelve cases of myelocytic leukemia and nine cases of lymphocytic leukemia. Careful analysis shows that there is but a rough parallelism between the basal metabolism and the leukocyte count, the percentage of immature cells and the clinical condition of the patient. Though commonly subjective and objective improvement was coexistent with the lowered basal metabolism subsequent to irradiation, this was certainly not invariable. Parallelism seems closer in the cases of the lymphocytic leukemia group. It appeared that symptomatic improvement more closely approximated the diminution in metabolic rate than did the hematologic observations, conforming to expectations based on clinical experience. Thus, though the metabolic rate bears a more than casual relationship to the patient's state of well being, it certainly is not an infallible guide. It furnishes but one of several indications as to whether or not irradiation is necessary at a certain time in a particular case. The results further emphasize the necessity for individualization of therapy, based on the complete clinical picture in association with judgment resulting from a wide experience in this type of case. The technic of treatment was similar in all cases, but naturally the dosage as well as the site of irradiation was individualized. The conventional high voltage therapy technic was used; the tube potential amounted to either 160 or 189 kilovolts (valve tube and condenser equipment), with a filter of 0.5 mm. of copper + 1 mm. of aluminum. The quality of radiation corresponded to a half value layer in copper = 0.75 mm. and 1 mm., respectively. For the exposure of the spleen, long bones and lymph nodes the focal skin distance was 50 cm.; for general body exposure, however, it was from 60 to 100 cm. The dose applied per field varies from 100 to 200 roentgens (in air) for local areas, and from 25 to 50 roentgens for general body exposure. Not more than three areas in the case of local exposures, and not more than two areas in the case of general body exposure are irradiated at one sitting. There is no doubt that, in the early stage, moderate potentials will produce good results; however, as soon as there is less response during a series of treatments than in the beginning, a change to high voltage therapy should be made. So far the authors have not employed general body exposure as a routine in all cases but have reserved it for those that did not respond to the usual methods, particularly in the later stage of the disease. Several striking remissions were seen among such cases.

Rhode Island Medical Journal, Providence

19: 43-58 (April) 1936

Social Medicine and the Doctor. R. Hammond, Providence.—p. 43.
Report of the 1935 Epidemic of Acute Anterior Poliomyelitis. K. K. Gregory, collaborators D. L. Richardson, E. J. West and R. E. Stevens, Providence.—p. 47.

Tennessee State Medical Assn. Journal, Nashville

29: 167-208 (May) 1936

Past and Present. J. B. Steele, Chattanooga.—p. 167.
Tuberculin Therapy in Ocular Tuberculosis. M. H. Post, St. Louis.—p. 174.
Tennessee's State Health Program. W. C. Williams, Nashville.—p. 182.
The Importance of Examining Familial Contacts of Tuberculous Individuals. R. S. Gass, Nashville.—p. 188.
The Formulation of Diabetic Dietaries (A "One, Two, One-and-a-Half" Method for Preliminary Use with Adult Ambulatory Patients). R. C. Derivaux, Nashville.—p. 194.

Texas State Journal of Medicine, Fort Worth

32: 1-68 (May) 1936

Account of Early History of Surgery in Texas. A. O. Singleton, Galveston.—p. 6.
Alvar Nunez Cabeza de Vaca (1490-1564), First European "Physician and Surgeon" in the United States. W. G. Stuck, San Antonio.—p. 15.
Bone Grafting Following Gas Bacillus Infection. J. P. Barnes, Houston. —p. 21.
Fractures of Femur. M. M. Brown, Mexia.—p. 25.
Fracture of Patella: Report of Unusual Case. J. M. O'Farrell, Houston.—p. 28.
Remarks on Nasal Tuberculosis. S. A. Schuster, El Paso.—p. 31.
The Management of Thyroglossal Tract Cysts and Fistulas. J. W. Hendrick, Amarillo.—p. 34.
Orthoptic Training and Management of Concomitant Strabismus in Children. L. T. Post, St. Louis.—p. 36.
Roentgen Diagnosis of Lesions of Small Intestine. J. B. Johnson and H. C. Harrell, Galveston.—p. 41.
X-Ray in Benign Gynecologic Conditions. L. W. Kuser, Gainesville.—p. 45.

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FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Medical Journal, London

1: 781-826 (April 18) 1936

*Influence of Gallbladder and Other Infections on Incidence of Coronary Thrombosis. S. B. B. Campbell.—p. 781.
Results of Radium Treatment of Carcinoma of Cervix Uteri. W. F. Shaw and D. Dougal.—p. 786.
Acute Otitis Media: Its Treatment, with Results. A. Campbell.—p. 788.
Chronic Suppurative Otitis Media: Its Operative Treatment. M. R. Sheridan.—p. 791.
Lower Segment Cesarean Section. J. Riddell.—p. 792.
Progressive Familial Hypertrophic Neuritis (Dejerine-Sottas). E. L. Cooper.—p. 793.

Influence of Infections on Incidence of Coronary Thrombosis.—Campbell attempts to prove that there is an association between infection and the great increase in coronary thrombosis, while in no way disputing the fact that atheroma is increasing. Infections of the gallbladder are those most commonly associated with this cardiac lesion. He discusses illustrative instances of coronary thrombosis associated with cholecystitis and presents cases of coronary thrombosis following attacks of influenza, phlebitis, pyogenic infections, syphilis and diabetes. The cases demonstrate the fact that concurrent or previous infections are found in many cases of coronary thrombosis. More cases could be quoted bearing out the same intimate relationship. It is difficult to prove that these infections are the determining cause of the severe cardiac lesion, but the fact that lesions such as those of the gallbladder are found makes it essential that everything possible should be done to eliminate any focal infection in the hope that cardiac failure may be averted. The difficulties in diagnosis are due to the fact that varying degrees of anginal pain can be simulated by gallstone colic or by the pain of cholecystitis. Attacks of coronary thrombosis have to be differentiated from ordinary angina, acute abdominal disorders, such as perforations, acute cholecystitis, acute pancreatitis, diabetic ketosis—often a transient glycosuria, though coronary thrombosis is found in diabetes—and lobar pneumonia, in which a wrong diagnosis is sometimes made.

Journal of Tropical Medicine and Hygiene, London

39: 77-88 (April 1) 1936

Observations on Life History of Spirochetes of Relapsing Fever. A. C. Coles.—p. 77.
Self Inoculation of Leprosy: Preliminary Note. S. Lagoudaky.—p. 81.

Lancet, London

1: 931-986 (April 25) 1936

Assessment of Dental Sepsis as Factor Affecting Medical and Surgical Procedures. A. Bulleid.—p. 931.
Induction of Labor for Disproportion: Critical Analysis of One Hundred Consecutive Cases of Surgical Induction for Real or Suspected Disproportion. J. H. Peel.—p. 935.
*Effect of Chloral Hydrate on the Heart. S. Alstead.—p. 938.
*Possible Transmission of Hemolytic Streptococci by Dust. Elizabeth White.—p. 941.
Treatment of Phlebitis in Varicose Veins. H. I. Biegeleisen.—p. 944.
Treatment of Tuberculous Cervical Glands. B. C. Thompson.—p. 946.
Spectrographic Anomalies of Gastric Juice in Pernicious Anemia. L. Karczag.—p. 947.
*Tuberculous Thrombophlebitis of Lower Extremity. E. Altschüler.—p. 948.
Toxic Purpura Haemorrhagica Complicating Scarlet Fever. J. E. Morrish.—p. 949.

Effect of Chloral Hydrate on the Heart.—Alstead assessed the value of chloral hydrate in fifty-five cases, giving particular attention to the cardiac action and blood pressure. In thirty-three cases there was clinical evidence of heart disease and in the remaining twenty-two, though the heart was apparently normal, marked emphysema was found in seven and acute rheumatism and exophthalmic goiter in two. A hypnotic effect was produced by 1.3 Gm., the official dose. The drug in ordinary doses is entirely free from the disadvantages of tolerance and habit formation but is best avoided in the presence of gastro-intestinal irritation, although this can be eliminated by sufficient dilution with water. Smarting of the eyelids and lacrimation were troublesome in about 5 per cent of the patients under observation. This occurred only after several days during which the dosage had been frequent and substantial. Physical examination of the heart yielded no unequivocal evidence of weakening of the cardiac action by chloral hydrate. Only three cases appear to admit of some discussion on this point, but the results of further investigation of the cardiovascular system were inconsistent with cardiac damage. Clinical evidence of improvement in the action of the heart was seen in two cases. No significant changes occurred in the heart rate. About half the patients showed some fall in blood pressure. The decrease did not exceed 15 mm. of mercury and, as there was no alteration in the condition of the heart, the change in blood pressure was regarded as being consistent with prolonged periods of sleep and almost continuous drowsiness. In the few cases in which the blood pressure was depressed more than 15 mm. of mercury, conditions other than the administration of the hypnotic were regarded as being the main causes. Nearly a fourth of the patients were found to have an increased blood pressure after taking chloral hydrate. The results support the view that chloral hydrate is not particularly detrimental in the presence of heart disease. When the blood pressure is lowered during chloral hydrate administration, the effect is not much greater than occurs in natural sleep.

Transmission of Hemolytic Streptococci by Dust.—White carried out tests on the air and the dust for the hemolytic streptococcus in twenty-seven single bed wards between the third and the sixth day after the patients were admitted. The dust of the twenty-seven wards housing patients who were discharging hemolytic streptococci was always contaminated with the organism, and in most cases the strain isolated from the dust was proved to be identical with that infecting the patient. The dust of similar wards housing patients infected with other organisms seldom yielded hemolytic streptococci, and then only very scanty growths. Spraying with 40 per cent solution of formaldehyde destroyed the hemolytic streptococcus in rooms contaminated with that organism. A case is reported in which exposure to dust carrying the hemolytic streptococcus was almost certainly responsible for an acute pharyngitis. Although no opportunity has occurred for investigating the point, it would seem unlikely in view of the experiments reported by Colebrook (1933) that a healthy throat carrier of the hemolytic streptococcus creates a zone of streptococcus-carrying particles around himself.

Tuberculous Thrombophlebitis of Lower Extremity.—Altschüler states that in the cases of tuberculosis of veins described it was not a matter of a disease confined to the wall of the vein; the vein was infected by invasion from the surrounding tissues and there were always advanced tuberculous changes, with miliary infection of the viscera. In the author's two cases the organs are not demonstrably diseased. The tissue surrounding the vein was free from infection and only the intima was attacked. He cannot explain the etiology; no port of entry was discovered on the lower leg in spite of most exact interrogation of the patient. The inguinal glands were removed and examined but were not diseased. He believes that tuberculous disease of the veins of the extremities is not rare, and, if so, there is a wide field for research into its causes and its treatment.

Medical Journal of Australia, Sydney

1: 489-524 (April 11) 1936

Psychologic Aspect of General Medical Practice. S. O. Cowen.—p. 489.
Harelip. H. D. Stephens.—p. 494.
Id.: Vilray P. Blair's Modification of Mirault's Operation. R. G. Brown.—p. 499.
Antidiphtheria Inoculation: Delayed Reactions in Preliminary Testing. C. R. Merrillees.—p. 503.

South African Medical Journal, Cape Town

10: 247-278 (April 11) 1936

Bilateral Artificial Pneumothorax. H. R. Ackermann.—p. 257.
Surgery in General Practice. R. Schaffer.—p. 260.

Japanese Journal of Gastroenterology, Kyoto

8: 1-58 (April) 1936

Vagus Nerves and Experimental Liver Cirrhosis: I. Pathologic Histologic Investigations. S. Matsumoto.—p. 1.
Id.: II. Investigation on Pigment Excretion of Liver. S. Matsumoto.—p. 6.
Experimental Study on Process of Gallstone Formation: Reports I to VI. T. Kurokochi.—p. 11.

Archives des Maladies de l'App. Digestif, Paris

26: 481-624 (May) 1936

Tracing Acute Diffuse Hepatitis of Chronic Alcoholism by Test of Stimulated Galactosuria Concentrations. Chiray, G. Albot and M. Deparis.—p. 481.
Diverticula of Stomach: Two Cases. Ledoux-Lebard, P. Hillemand, Garcia Calderon and W. Aubrun.—p. 527.
*Pyloric Decentration: Roentgenologic Sign of Gastroduodenal Ulcer. A. Chapuy.—p. 534.
Gee-Herter's Disease (Celiac Disease). R. S. Mach.—p. 544.
Measured Compression in Exploration of Digestive Mucosae. R. Gilbert and L. Babaiantz.—p. 556.
*Carbon Tetrachloride, Preferred Antihelminthic Against Tapeworm. R.-V. Talice.—p. 576.

Pyloric Decentration.—Chapuy believes that normally the pylorus should lie in a position which is constant in relation to the stomach. He believes that the pylorus lies normally always in the axis of symmetry of the antral region. Decentration exists in those instances in which the pylorus does not lie in this axis of symmetry. Even a slight deviation from the axis has the same diagnostic value as a more marked decentration. With roentgenographic examination these facts can be satisfactorily demonstrated. There are a few causes for error, notably error of interpretation, neoplasm of the lesser curvature of the stomach and prepyloric dilatation. These can usually be eliminated by proper technic. The author thinks that the value of the procedure lies in the fact that pyloric decentration in the absence of any other abnormal image is practically pathognomonic of gastric duodenal ulcer. Furthermore, he has been able to demonstrate delayed gastric emptying in all patients showing decentration. He believes that these facts point to ulcers as truly a disease of the stomach and that one is dealing with a purely functional image rather than a static picture.

Carbon Tetrachloride for Tapeworm.—Talice believes that carbon tetrachloride is by far the most effective parasiticide against Taenia saginata. Before using the substance, he attempts to avoid intestinal absorption by forbidding his patients fatty substances and especially alcohol during the treatment. Furthermore, the treatment is contraindicated in patients having icterus, hepatic insufficiency, acute enteritis or generalized infections. Carbon tetrachloride has an indirect action on the blood calcium. To avoid accidents resulting from hypocalcemia he gives calcium chloride during the week preceding the administration of the drug. A dose of from 3 to 4 cc. is given according to the weight of the patient. Immediately after ingestion the patients are given a strong saline purgative and advised to rest in bed at least during the day of the treatment. During the day the ingestion of sweetened drinks is allowed. Recovery was recognized only when the head of the worm was identified. Of the sixty-seven adults treated in this manner, sixty-one were cured with one treatment. Four were cured with two treatments and two failed to return for a second treatment. The author concludes that, when used with proper precautions, this method is superior to any other in the treatment of infestation with Taenia saginata.

Revue de Chirurgie, Paris

55: 263-330 (April) 1936

Connective Tissue Cysts of Spermatic Cord. Fiori.—p. 263.
Walled Off Perforated Ulcer. H. Costantini and É. Curtillet.—p. 268.
Postoperative Peptic Ulcer at Mesenteric Edge of Jejunum. P. Santy, P. Mallet-Guy and J. Soustelle.—p. 287.
Acute Emphysema of Mediastinum Following Thoracic Traumatisms. L. Courty.—p. 299.
*Hypogastric Neurotomy and Periaortic and Peri-Iliac Sympathectomy as Integral Part of Certain Abdominal Operations. V. Bojovitch.—p. 320.

Hypogastric Neurotomy and Periaortic Sympathectomy.—Bojovitch discusses in detail nine cases in which he has performed a presacral resection and in some a periaortic and peri-iliac sympathectomy in addition. Three cases were inoperable cancer of the cervix and six were different gynecologic diseases which necessitated radical abdominal operation. The three patients in the first group were operated on by lumbar anesthesia, after which a resection of the hypogastric plexus was performed with the intention of reaching as many filaments of the nerves as was possible. A similar lumbar anesthesia was performed in the second group, and in several instances resection of the presacral nerve was supplemented by periaortic and peri-iliac sympathectomy. After having performed sympathectomy of the abdominal aorta and the two iliac vessels, the author isolated the latter by means of the parietal peritoneum. The results of the procedure outlined were quite favorable. The postoperative pains which follow every abdominal operation were limited in most of the cases to the incision area. Diuresis was increased, and micturition was performed several times in twenty-four hours. Resection of the hypogastric plexus and the sympathectomy produced a favorable action on postoperative intestinal obstructions and diarrhea. Periarterial sympathectomy by means of its vasomotor and reflex action and by other means which are not yet clear has a favorable action on the surgically produced lesions. The author believes that this method of operation is to be recommended in several types of painful gynecologic conditions.

Clinica Medica Italiana, Milan

67: 289-362 (May) 1936

Topographic Diagnosis of Intraspinal Tumors. G. Boattini.—p. 291.
Modifications in Electrocardiogram in Glycemic Disturbances. G. Giauni.—p. 309.
*Total Creatinemia in Cardiac Diseases. R. Messina.—p. 324.
Proteases in Fluids of Effusions. N. Fucci.—p. 332.
*Achylic Hypochromic Anemia in Course of Chronic Intestinal Amebiasis. E. Greppi and S. Deleonardi.—p. 349.

Total Creatinemia in Cardiac Diseases.—Messina studied the behavior of total creatinemia in patients suffering from cardiac diseases in conditions of compensation or decompensation and also the relations between creatinemia and the residual nitrogen in the blood of the same patients. He found that the average amount of creatinemia, which is 4.8 mg. in normal persons, is 7.15 mg. in patients suffering from cardiac diseases in compensation and 12.27 mg. in the same type of patients having decompensation. In each case azotemia is normal. Total hypercreatinemia in these cases is due to metabolic disturbances of the myocardium rather than to retention of creatine and creatinine in the blood due to renal insufficiency, and it is unrelated to azotemia.

Achylic Hypochromic Anemia in Intestinal Amebiasis.—Greppi and Deleonardi report a case of achylic hypochromic anemia in the course of intestinal amebiasis and lambliasis in an adult. The hematologic picture was that of achylic chloranemia, which is characterized by true microcytosis with preponderance of globules of maximal resistance and scanty hemolysis. It was controlled by the administration of iron in large doses (8 Gm. daily for fifty days) up to normalization of the crasis of the blood. The author states that the gastroanemic syndrome was secondary to gastric achylia, which resulted from the presence of chronic gastritis in intestinal amebiasis. The latter, as well as certain parasitic infestations, inflammations and tumoral processes of the digestive tract, may produce a gastro-anemic syndrome, either of a pernicious macrocyte nature (pernicious anemia) or of a chlorosic microcytic one (true microcytosis). Both forms of anemia develop from a pathologic condition related to a deficiency of the gastric secretions and are in direct relation to the latter and in indirect relation to the former. Both forms of anemia are controllable by specific therapy (liver and iron, respectively) thus proving their autonomic pathogenesis. In the authors' case the normalization of the blood coexisted with attenuation of the parasitic infestation and the symptoms of colitis, probably resulting from the improvement of the digestive functions and general condition of the patient because of the normalization of the blood.

Prensa Médica Argentina, Buenos Aires

23: 1083-1138 (April 29) 1936

Alimentary Mineral Substances. J. C. Navarro and Sara de Alzaga.—p. 1083.
*Pernicious Anemia Due to Trichocephalus Trichiura: Case. A. Battaglia and E. C. Arata.—p. 1094.
Problem of Prevention of Syphilitic Aortitis. J. L. Carrera.—p. 1101.
Pneumococcic Peritonitis. O. L. de Goycoechea.—p. 1102.
Acute Ostiomyelitis of Fibula: Diaphysectomy. J. E. Rivarola.—p. 1126.

Pernicious Anemia Due to Trichocephalus Trichiura.—Battaglia and Arata's patient, a woman, aged 29, presented a clinical picture of anemia associated with digestive and nervous disorders. The condition had lasted for more than six months and the pallor and emaciation of the patient were extreme. The intense anemia was of a progressive pernicious type. The digestive disorders were characterized by uncontrollable vomit-

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ing, nausea, anorexia and the passage of feces having an appearance of milk curd. Occasionally they had traces of blood. The nervous disorders appeared in crises of cervical pain, tremor of the extremities and crying. Neither syphilis nor infectious diseases were in the history of the patient. The examinations of the feces showed Trichocephalus trichiura. The administration of several treatments against the intestinal parasitic infestation until complete disappearance of the parasites in the feces resulted in gradual improvement of the blood and clinical picture with eventual recovery of the patient, which has lasted up to the present time, four years after discontinuation of the antiparasitic treatment.

Semana Médica, Buenos Aires

43: 1509-1580 (May 14) 1936. Partial Index

Bilateral Collapsotherapy (Phrenicectomy Following Artificial Pneumothorax) in Pulmonary Tuberculosis. F. Etcheverry Boneo.—p. 1515.
*Multiple Myeloma (Kahler's Disease): Case. R. Dassen, A. Fisher and P. C. Rospide.—p. 1527.
Late Postappendectomic Fistula Complicating Acute Appendicitis of Appendicular Stump: Case. E. A. Votta and J. A. Bracco.—p. 1536.
Esophagogastrostomy by Abdominal Route (Heyrowsky's Operation): Technic. R. C. Ferrari.—p. 1539.
*Biologic Treatment of Gonorrheal Vulvovaginitis in Virgins. D. H. Negrete and E. Fontán Balestra.—p. 1556.
Roentgen Image of Hydro-Aereal Levels in Mechanical Ileus: Roentgenograms of Intestinal Obstruction and Occlusion. H. L. Mazza.—p. 1559.

Multiple Myeloma.—According to Dassen and his collaborators, a roentgen examination of the skeleton is advisable in patients suffering from anemia of a pernicious type of unknown origin for detection of the possible presence of multiple myeloma. The most important roentgen signs are the lack of deformation of the bone and the presence of shadows corresponding to round clear zones in the bone. The disease may develop and evolve, aside from the production of fractures, presence of pain in the bones and other known symptoms, with splenomegaly and intense anemia of a pernicious type, emaciation, bilateral pleurisy and anasarca of rapid reproduction after removal of fluids. The blood picture is that of an intense anemia and favorably reacts to the administration of liver extracts. The treatment, which is palliative, consists in care of the patient to prevent the production of fractures, controlling the pains by the administration of analgesics and morphine, if necessary, controlling the anemia, evacuating the pleural cavity and giving diuretics to reduce the anasarca. Arsenic fails to control anemia. Hepatotherapy controls splenomegaly and anemia but does not interfere with the general evolution of the disease and the more or less rapid progress of cachexia. Roentgen irradiations fail to improve the bone conditions. The expectancy for the life of the patient is from one to four years. One case is reported.

Treatment of Gonorrheal Vulvovaginitis in Virgins.—Negrete and Fontán Balestra state that Mendez's treatment of vulvovaginitis in virgins consists in daily subcutaneous injections of a vaccine prepared with bacteria of the type found in the vaginal secretions and intravaginal application, every other day, of an ointment prepared with the same type of bacteria. The vaccines are prepared with one or more bacteria. The amount of ointment used is 5 cc. for each application. The expulsion of the ointment from the vagina is prevented by covering the vulva with a piece of gutta-percha held in place by adhesive tape, thus forming a local "closed cavity." Washing of the involved parts is avoided. The patient is given every morning a spoonful of oil for correction of constipation. Bacterial examinations of the vaginal secretions are frequently made during the treatment. If the bacterial flora changes, the bacterial vaccine is also changed to one containing the bacteria present in the vaginal secretion. The treatment is discontinued altogether on complete disappearance of the pathogenic bacteria from the vaginal secretions, which takes place in a short time. The merit of the treatment consists in maintaining the vaginal exudates in direct contact with the local tissues because of their antiseptic and antibody forming properties and also in stimulating the organism to the formation of a large amount of antibodies and haptens by means of the bacterial vaccine and of the local application of the bacterial ointment. Satisfactory results in several cases of varying intensity and duration are reported.

Monatsschrift für Kinderheilkunde, Berlin

65: 225-384 (April 29) 1936. Partial Index

Icterus Neonatorum Gravis. F. Thoenes.—p. 225.
Spontaneous Pneumothorax. I. H. Alantar.—p. 235.
Changes Caused by Pentose Nucleotide in Blood Picture of Normal Nursling. C. Laguna.—p. 242.
Curves of Gastric Secretion in Nurslings. W. Steinman.—p. 264.
*Modification of Growth of Bacillus Coli and Bacillus Lactis-Aerogenes by Acidity of Milk. H. Bock and W. Binder.—p. 285.
Modification of Experimental Diphtheria by Vitamin C and Adrenal Cortex Extract. Aline Aicham and H. Bock.—p. 289.

Influence of Acidity of Milk on Bacillus Coli.—Bock and Binder say that the favorable action of sour milks in dyspepsia of nurslings is undisputed and has been proved by years of experience. In order to explain this action it is necessary to investigate the bacterial conditions in dyspepsia of nurslings. Since other investigators have come to the conclusion that the growth of the bacilli of the group lactis-aerogenes is hardly at all inhibited by an acid milieu, the authors decided to investigate to what extent the inhibition of the growth of Bacillus coli on the one hand and of Bacillus lactis-aerogenes on the other hand is dependent on the degree of acidity and what practical conclusions may be drawn from this as regards dyspepsias of nurslings. They determined the acid sensitivity of twenty-one B. coli strains and ten B. lactis-aerogenes strains and found that the latter are only slightly less sensitive to acidity than the former and they think that this slight difference is of no practical importance. The p_H values at which the growth of the investigated bacteria is greatly inhibited are near to or identical with the p_H values of the sour milks. Thus it is proved that the sour milks are helpful in the prevention and treatment of dyspepsias of nurslings.

Münchener medizinische Wochenschrift, Munich

83: 713-754 (May 1) 1936. Partial Index

Changes and Social Reforms in Diabetes Problem. G. Singer.—p. 713.
*Puerperal Neuritis of Traumatic Origin. G. Gaehtgens.—p. 720.
Provocation of Attacks of Epileptic Convulsions. Schönmehl.—p. 721.
*Pathogenesis of Facial Erysipelas. W. Schultz.—p. 723.
Family with Camptodactylia. P. Ritterskamp.—p. 724.
Dangers of Physical Therapy in Practice. F. Lickint.—p. 727.

Puerperal Neuritis of Traumatic Origin.—Gaehtgens points out that traumatic puerperal neuritis of the lower extremities plays a more important part than is generally assumed. He concedes that it is not always easy to differentiate it from disturbances that are of toxic origin, for the puerperal period seems to be characterized by a tendency to toxic neuritis or neuropathia. However, a traumatic cause may be assumed whenever the delivery was difficult, and particularly when obstetric interventions were necessary. The author describes two cases. Both women passed through an extremely difficult delivery. Moreover, the pelvic anomalies created the predisposition for lesions of the lumbosacral nerve trunks, and the obstetric operations increased the possibility of severe lesions of the nerves. The second case is practically identical with another case reported in the literature in that in both cases lesions of the peroneal and tibial nerves existed. The patients had a halting walk and were incapable of lifting the lateral portion of the foot and of abducting it; the capacity for plantar flexion was impaired and, as an indication of tibial paralysis, the movement of the toes was greatly restricted. In regard to the treatment, the author says that restitution depends on the severity of the lesion. He thinks that spontaneous cure may be expected in the majority of cases. To be sure, heat, massage and electrotherapy may accelerate the curative process. Induced by favorable reports about the efficacy of vitamin B_2 in cases of postdiphtheric paralysis and in various types of neuritis, the author gave daily subcutaneous injections of a vitamin B_2 preparation and noted considerable improvement after eight injections.

Pathogenesis of Facial Erysipelas.—Schultz points out that at present it is generally believed that erysipelas is caused by the entrance of the pathogenic agent into defects of the skin or of the neighboring mucous membranes. The fact that the face is most often affected in cases of erysipelas is ascribed to the greater incidence of small injuries on the face and to the fact that aural and nasal diseases often are the point of origin of erysipelas. The author shows that a number of factors can be cited against this theory of pathogenesis, which is based on bacteriologic aspects. The author cites a statistical

report of 211 cases of facial erysipelas which indicates a greater incidence of the disorder in women and also in certain age groups. After puberty there is a great increase and in women the greatest incidence occurs during the menopausal age. This fact indicates that facial injuries cannot be the chief factor, for injuries of the face or of neighboring organs are not more frequent in that age group. Further, the author calls attention to a relationship with tonsillar infections. In this connection he cites the case of a woman, aged 46, who developed a facial erysipelas after nursing children who had tonsillitis, and he assumes that the facial erysipelas, like the tonsillitis, developed hematogenically. At any rate there is considerable evidence that in many cases of erysipelas constitutional factors play a part and that there is some justification for the hippocratic differentiation between idiopathic and traumatic erysipelas.

Wiener klinische Wochenschrift, Vienna

49: 609-640 (May 15) 1936. Partial Index

Organization of Campaign Against Cancer at Women's Clinic of University of Graz. H. Siegmund.—p. 609.
*Atypical Lead Poisoning by Tap Water. O. Altmann and K. Nowotny. —p. 613.
Focus of Tick Larvae in Tyrol and Remarks on Dermatitis Caused by Meadow Plants. K. Toldt.—p. 616.
Plastic Operations on Renal Pelvis in Hydronephrosis. T. Hryntschak. —p. 620.
Laws of Allergy. B. Jegorow.—p. 621.

Atypical Lead Poisoning by Tap Water.—Altmann and Nowotny describe four cases of a complicated but primarily spinoperipheral neurologic disorder, which were observed at their clinic within a comparatively short period. The diagnosis as well as the etiology presented at first considerable difficulties, but the fact that the four patients came from the same district of a city in Lower Austria led to the discovery that the lead content of the tap water of that district was responsible for the disorders. The urine of the patients showed a considerably increased porphyrin content and also lead, and the drinking water of the city in question contained much more than the permissible amount of lead. However, although more than 5,000 persons were exposed to the same influence, the four persons (three were women) whose cases are described here were the only ones who contracted this disorder. The authors think that this indicates a predisposition for lead poisoning, which has been observed also among workers who are exposed to lead intoxication.

Nederlandsch Tijdschrift voor Geneeskunde, Haarlem

80: 2753-2828 (June 13) 1936

Tuberculosis of Kidneys with Complications. E. Deddes.—p. 2754.
*Hypoglycemia in Everyday Practice in Apparently Healthy Persons. E. Janssen.—p. 2761.
Crystallization Process at the Basis of Blood Coagulation. E. Hekma. —p. 2764.
Treatment of Hyperthyroidism. L. J. Frijda.—p. 2771.

Hypoglycemia in Apparently Healthy Persons.—Janssen states that, although the symptoms of hypoglycemia are well known nowadays to every practitioner and the patient himself generally notices the initial disturbances, it is surprising that children do not notice them and consequently are unable to give timely warning of an impending attack. Hypoglycemia in children often is ushered in by changes of character which may come to expression in fits of temper. The author mentions two forms of hypoglycemic symptoms which he found in his practice. The first was in a boy, aged 9, who had no appetite and could not concentrate at school. When his attention was requested, he became impolite and was punished. On returning home from school he would lie down, complain of being tired, look pale and have cold sweat on the forehead. Then he would be somewhat nauseated and unable to eat, although he was hungry shortly before. A couple of sugar tablets dispelled the attack, and appropriate treatment resulted in giving the boy normal health and in making him a good scholar. The second form occurred in a young woman who was nursing a four months old baby and complained of pain between the scapulae and in the back and of feeling dizzy and nauseated after each nursing. Determination of blood sugar showed it to be 0.072 Gm. per hundred cubic centimeters before and 0.053 after nursing. A small amount of sugar taken before each nursing cured the symptoms, and the back pain disappeared when the diet of the patient was regulated.

Acta Medica Scandinavica, Stockholm

88: 407-625 (May 27) 1936. Partial Index

Inhibition, Inversed Reaction, Tonicity and Trophic Processes. N. Kabanow.—p. 407.
Heparin: Its Chemical Nature and Properties. E. Jorpes.—p. 427.
*Influence of Intravenous Injections of Heparin in Man on Time of Coagulation. P. Hedenius and O. Wilander.—p. 443.
Heparin in Blood Transfusion. E. Sköld.—p. 450.
*Sedimentation Reaction with Heparin. B. Enocksson, A. Gjertz, Å. Schnell and T. Torgersruud.—p. 455.
Sodium Content of Blood in Essential Hypertension and Simmonds' Disease. E. Kylin and H. Elmquist.—p. 507.
*Blood Metabolism and Urobilinuria in Cardiac Insufficiency. M. C. Ehrström.—p. 517.

Influence of Heparin on Coagulation Time.—Hedenius and Wilander say that, although many methods have been tried to lessen the risk of postoperative thrombosis, the most natural anticoagulant, heparin, has not been used for that purpose. They point out that heparin has so far been employed almost exclusively in animal experiments, because the available preparations were not pure enough for intravenous injections in human beings. In recent years it has become possible to obtain heparin in a fairly pure state. The authors used a protein-free, sterile, 5 per cent solution which contained approximately 0.25 per cent of tricresol. Before administering the substance to patients, the authors made preliminary experiments on rabbits and on themselves. The investigations revealed that the intravenous injection of heparin (from 50 to 150 mg.) results in normal persons in a considerable prolongation of the coagulation time. Different persons react fairly uniformly to the same dose of heparin. The prolongation of the coagulation time is not quite proportional to the dose of heparin, in that the effect of smaller doses is relatively stronger. By repeated injections of small doses of heparin (from 50 to 25 mg. every three hours) a prolonged heparin effect can be obtained. The treatment with heparin seemed to cause no objective or subjective disturbances.

Sedimentation Reaction with Heparin.—Enocksson and his associates have investigated in what relation the sedimentation reaction with heparin has an advantage over that with citrate. They reach the conclusion that the heparin sedimentation reaction represents the actual sedimentation reaction, is more sensitive than that which is made with citrate, and has the advantage that the necessity for a special syringe is done away with; if necessary the blood can be taken from a puncture in the finger, or in some other way, when there is any difficulty in obtaining venous blood. Against these advantages, hardly any drawbacks can be mentioned, except that the heparin test is more expensive than the citrate test. The appearance of lower sedimentation values with heparin than with citrate in cases of anemia and fever is comparatively rare. With a material of about 2,000 cases the authors gained the impression that these lower values in cases of the heparin test are often due to the use of too small amounts of heparin, so that coagulation is not completely inhibited. They are convinced that if this fact is taken into consideration the lower values with heparin will be rarely found.

Blood Metabolism and Urobilinuria in Cardiac Insufficiency.—Ehrström studied the blood metabolism and the behavior of urobilinuria in ten patients with cardiac insufficiency. To obtain information about the metabolism of the blood, he counted the reticulocytes, determined the volume of the blood, took an erythrocyte count, determined the hemoglobin content and examined the pigmentation of the serum. He determined the total elimination of urobilin and observed the urobilinuria. During the period of insufficiency there exists a true reticulocytosis, which, however, subsides when compensation is achieved. This subsidence is accompanied by an increase in the total urobilin elimination. Expressed differently, the blood metabolism of patients with cardiac insufficiency is characterized by an increased hematopoiesis during the period of insufficiency and an increased hemolysis during the subsidence of the insufficiency. The most probable cause of these changes in the blood metabolism is the anoxemia. The urobilinuria of patients with cardiac insufficiency shows such a pronounced parallelism to the urobilin elimination in the feces that it appears probable that the hemolysis is a dominating factor in the pathogenesis of the urobilinuria during cardiac insufficiency.

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